Vol. 909 Number 3

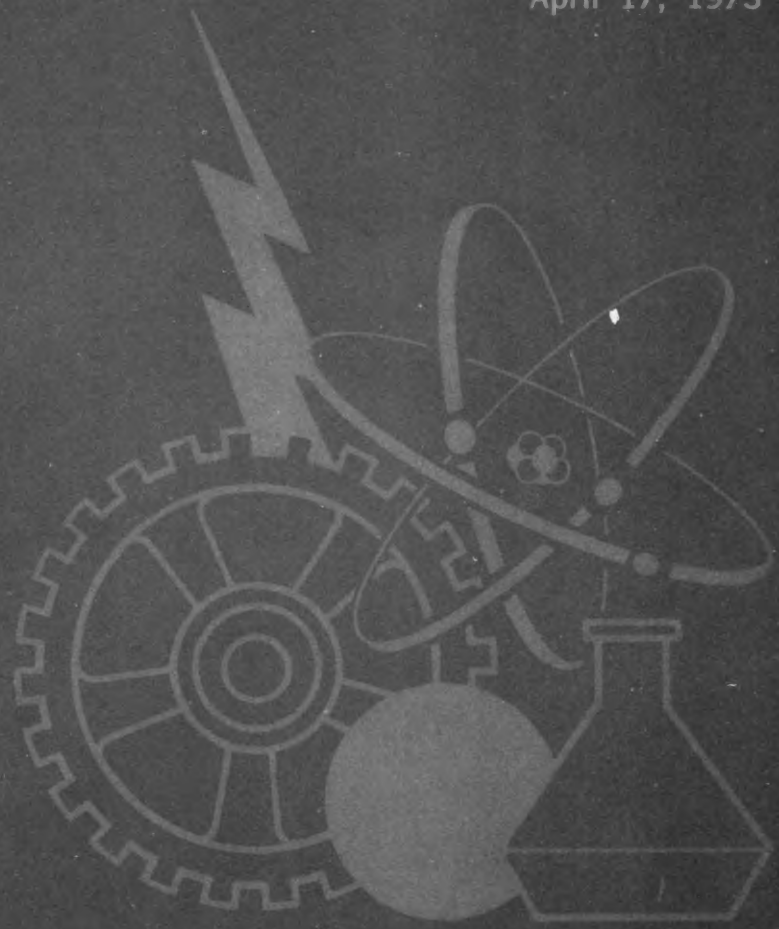
OFFICIAL GAZETTE

of the UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

April 17, 1973



U.S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

April 17, 1973 Volume 909 Number 3

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Certificates of Correction for the Week of Apr. 17, 1973

3,553,266	3,678,423	3,690,758	3,696,115
3,574,481	3,679,045	3,691,110	3,696,142
3,589,169	3,679,742	3,691,205	3,696,192
3,603,659	3,679,815	3,691,244	3,697,913
3,608,139	3,679,970	3,691,251	3,698,677
3,619,763	3,681,182	3,691,260	3,698,993
3,621,598	3,681,536	3,691,309	3,699,907
3,630,619	3,681,836	3,691,775	3,700,488
3,637,938	3,682,554	3,691,934	3,700,537
3,644,698	3,682,562	3,692,010	3,700,573
3,644,777	3,682,689	3,692,080	3,700,585
3,645,538	3,683,536	3,692,386	3,700,657
3,645,955	3,683,654	3,692,454	3,700,898
3,645,976	3,683,848	3,692,565	3,701,444
3,645,445	3,684,128	3,692,635	3,702,096
3,646,303	3,684,697	3,692,728	3,702,133
3,646,505	3,684,706	3,692,835	3,702,327
3,647,652	3,684,812	3,692,874	3,702,424
3,651,229	3,685,289	3,693,420	3,702,490
3,651,323	3,685,828	3,693,460	3,702,776
3,652,783	3,686,131	3,693,702	3,703,304
3,660,681	3,686,428	3,693,744	3,703,552
3,662,194	3,686,704	3,693,897	3,704,149
3,662,541	3,687,315	3,694,378	3,704,665
3,663,023	3,687,486	3,694,508	3,705,169
3,663,252	3,687,894	3,694,546	3,705,436
3,665,427	3,688,209	3,694,724	3,705,595
3,667,227	3,688,438	3,695,018	3,705,822
3,667,348	3,688,678	3,695,146	3,705,888
3,670,733	3,688,836	3,695,459	3,706,242
3,671,958	3,689,105	3,695,663	3,706,603
3,673,048	3,689,586	3,695,709	3,706,950
3,674,038	3,689,811	3,695,790	3,707,025
3,674,097	3,689,980	3,695,832	3,707,406
3,677,120	3,690,031	3,695,910	3,708,704
3,677,366	3,690,177	3,695,955	3,708,461
3,677,357	3,690,226	3,696,005	
3,678,066	3,690,270	3,696,082	

Service by Publication

Robert L. Litle

In accordance with Rule 47 of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on August 30, 1971, of an application for patent entitled "Scintillation Counting Systems and Components," on behalf of Robert L. Litle, whose last known address is % P. A. Parish, Box 255, Grass Valley, Calif. 95945. The application was made in compliance with Rule 47(a) and 35 U.S.C. 116 by joint inventor Philip Ting without execution by the said Robert L. Litle. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Robert L. Litle in connection with the said application must be taken within thirty days of the publication of this notice.

RICHARD A. WAHL,
Assistant Commissioner of Patents.

Disclaimer

3,371,343.—*William K. Sones,* Baltimore, Md. AUTO COHERENT PHASE CODING APPARATUS. Patent dated Feb. 27, 1968. Disclaimer filed Mar. 19, 1973, by the assignee, *the United States of America, as represented by the Secretary of the Air Force.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 3, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-20-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-16-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-15-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-17-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-10-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-21-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-16-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-22-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-05-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-26-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-10-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-28-72

Expiration of patents: The patents within the range of numbers indicated below expire during April 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,740,117 to 2,743,441, inclusive
Plant Patents..... Numbers 1,467 to 1,471, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED APRIL 17, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T909,013

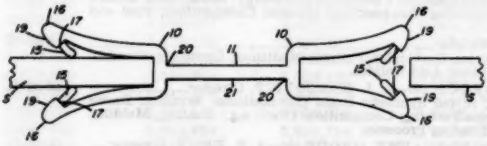
SLIDE STICK

Arthur C. Rissberger, Jr., Webster, N.Y. (1669 Lake Ave., Rochester, N.Y. 14650)

Filed Nov. 10, 1971, Ser. No. 197,352

Int. Cl. G09f *1/10*
U.S. Cl. 40—158

1 Sheet Drawing. 12 Pages Specification



A slide stick for returning a customer's processed and slide mounted transparencies so that a plurality of them can be simultaneously viewed by transmitted light without having to handle the slides individually. The slide stick preferably comprises two elongated substantially U-shaped channel sections connected in back-to-back relation by a web. A plurality of slides are inserted edgewise into each channel section in side-by-side relation and are frictionally held in place by resilient fingers extruding inwardly from each channel wall and rearwardly of the channels. The sticks are preferably of such length that two sticks will accommodate the number of slides obtained from a single roll of film, i.e. 12 or 20. The stick is preferably plastic and formed by a dual durometer extrusion technique, the channel sections and the web connecting them being formed of a plastic having a durometer hardness which renders these parts fairly rigid and the fingers formed from a plastic having a durometer hardness which makes them resilient.

T909,014

MASKING OF DEFECTS IN ELECTROPHOTOGRAPHIC ELEMENTS

Joseph Y. Kaukeinen, % Eastman Kodak Company, Kodak Park Division, 1669 Lake Ave., Rochester, N.Y. 14650

Filed Nov. 29, 1971, Ser. No. 203,017

Int. Cl. B44d *1/14*; G03g *5/00*
U.S. Cl. 117—2 R

No Drawing. 20 Pages Specification

A finely-divided electroscopic material with a high electrical resistance is deposited over a low conductivity electrical defect in the surface of a photoconductor element. The deposit of electroscopic material increases the effective electrical resistance of the defect area and thus, for example, reduces unwanted background density of a xerographic print made from such a photoconductor element. Preferably, the finely-divided electroscopic material is electrophoretically applied to the surface of a photoconductive element by means of a liquid developer composition. According to the invention an electrostatic charge is formed, in the dark, on the photoconductive layer of an electrographic element; then, in the dark, a finely-divided electroscopic resinous material carrying a charge of the same sign as the charge formed on the photoconductive layer is applied to said layer, whereby the electroscopic material is attracted to areas of the photoconductive layer which exhibit greater electrical conductivity than the rest of the photoconductive layer.

T909,015

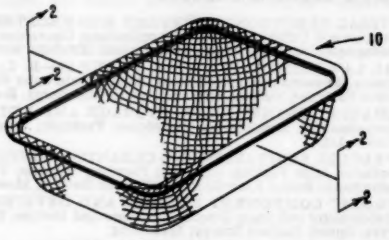
PLASTIC CONTAINER

James Thomas Pecka, Florence, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of abandoned application Ser. No. 111,263, Feb. 1, 1971. This application Mar. 10, 1972, Ser. No. 233,484

Int. Cl. B32b *1/00*
U.S. Cl. 161—89

1 Sheet Drawing. 10 Pages Specification



A thermoplastic container comprising a thermally formed thermoplastic netting member or first shell and a thermoplastic film member or second shell in contour-conforming configuration with and adhered to the netting member and in surface-surrounding relationship to its strands. The container is particularly useful for dispensing food products from vending machines since it can be subjected to electronic, convective or radiant heating.

T909,016

PRODUCTION OF LIQUID AMMONIUM POLYPHOSPHATE

Horace C. Mann, Jr., 1942 Holiday Drive, Florence, Ala. 35630

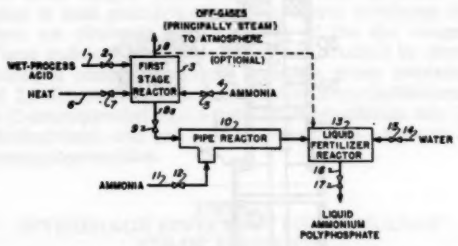
Filed Mar. 24, 1972, Ser. No. 237,627

Int. Cl. C05b *7/00*
U.S. Cl. 71—34

1 Sheet Drawing. 24 Pages Specification

A process for the direct production of liquid fertilizer base solutions free of noncarbonaceous precipitates and

that usually contains upwards of 80 percent polyphosphate but can contain in excess of 80 percent polyphosphate from wet-process orthophosphoric acid, ammonia, and water. The process involves partial neutralization of the feed wet-process acid and formation of some of the polyphosphate in the first reactor followed by further ammoniation of the partially neutralized acid in a second reactor which may be of the common pipe type and where the remainder of the polyphosphate is formed; the resultant melt from the pipe reactor is then processed directly into a liquid fertilizer. Sufficient heat, in addition to that derived from the heat of ammoniation,



PRODUCTION OF LIQUID AMMONIUM POLYPHOSPHATE FROM ORTHOPHOSPHORIC ACID

is added to the first reactor to form sufficient polyphosphate so that on further ammoniation, melts of high polyphosphate content are formed. The resultant liquid fertilizers contain sufficient polyphosphate to sequester the magnesium and other impurities that normally precipitate from liquid fertilizers made with wet-process orthophosphoric acids. The advantage of this process is that liquids higher in polyphosphate content than those usually made directly from wet-process superphosphoric acid and as high in polyphosphate content as those made by the TVA direct process from the wet-process superphosphoric acid can now be made with wet-process orthophosphoric acid without a separate concentration step.

T909,017

SULFUR DIOXIDE REMOVAL FROM STACK GASES

John E. Jordan, 1306 30th St., Sheffield, Ala. 35660, and George M. Newcombe, 200 Seven Oaks Road, Apt. 8–G, Durham, N.C. 27704

Filed Apr. 13, 1972, Ser. No. 243,636

Int. Cl. C01b *17/00*
U.S. Cl. 423—242

3 Sheets Drawing. 18 Pages Specification

Sulfur oxides can be removed from waste gases by absorption in ammoniacal solution forming ammonium bisulfite, ammonium sulfite, and, unavoidably, ammonium sulfate. The absorber effluent solution may be treated with ammonium bisulfate to form ammonium sulfate and to release a concentrated stream of SO_2 suitable for conversion to H_2SO_4 or elemental sulfur. Ammonium sulfate may be crystallized from the solution and thermally decomposed to ammonia for recycle to the absorber and ammonium bisulfate for recycle to the SO_2 release step. The economics of the process are improved by operating the absorber with an ammoniacal solution having a high content of ammonium sulfate; subsequent treatment of the scrubber effluent with ammonium bisulfate and, after SO_2 release, with ammonia causes precipitation of ammonium sulfate without evaporation of the large amounts of water required in earlier concepts of this process.

T909,018

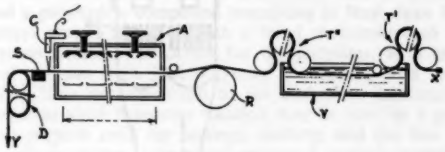
METHOD AND EQUIPMENT FOR HEAT-SETTING TREATMENT OF SYNTHETIC FILAMENTS BY MEANS OF INFRARED RAYS

Francesco Siclari, Bruno D'Alo, and Giulio Del Ninno, Milan, Italy, assignors to SNIA Viscosa Societá Nazionale Industria Applicazion Viscosa, Milan, Italy

Filed May 15, 1972, Ser. No. 253,115

Int. Cl. B29c *25/00*
U.S. Cl. 264—346

1 Sheet Drawing. 21 Pages Specification



A method and apparatus for the heat-setting treatment of synthetic filaments are provided. The filaments are arranged in a parallel manner and are advanced under a predetermined tension through a processing chamber wherein the filaments are subjected to infrared rays. The filaments also may be subjected to a contact heating operation upstream and/or downstream of the infra red ray processing chamber.

Within the chamber and above the filaments are positioned radiators for generating the infrared rays. Below the filaments are positioned reflecting surfaces. The infrared ray radiators are adjustably positioned with respect to the filaments. Radiation intercepting means, preferably in the form of movable louvers, are positioned between the filaments and the radiators. The louvers are movable from a position perpendicular to the filaments to allow maximum infrared ray access thereto, to a position parallel to said filaments to substantially block access of infrared rays thereto. The chamber is provided with a device to create continuous circulation of air therethrough. Advantageously, the direction of air flow within the chamber is perpendicular to the direction of movement of the filaments.

T909,019

NUCLEAR CORE INLET FLOW ARRANGEMENT

John F. Patterson, Jr., Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

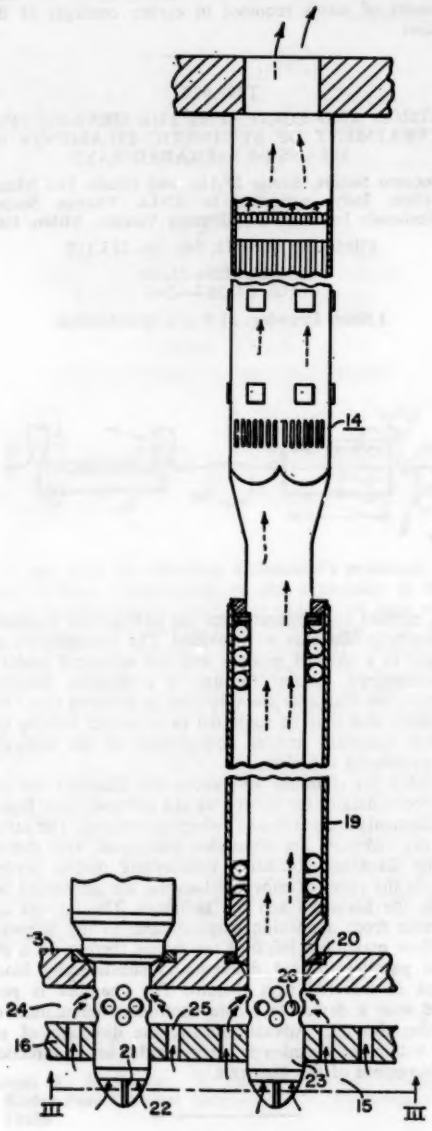
Filed June 13, 1972, Ser. No. 262,434

Int. Cl. G21c *15/22, 15/24, 19/28*
U.S. Cl. 176—61

1 Sheet Drawing. 11 Pages Specification

A nuclear core arrangement for admitting reactor coolant into nuclear reactor fuel assemblies. Inlet nozzles having main and alternate inlets are attached to the fuel assemblies. Each of the nozzle inlets receive reactor coolant from a separate flow plenum. The flow plenums are

arranged in parallel and are separated by a perforated sealing member. Should the main inlet to the fuel assembly become clogged by debris, the alternate inlet supplies the fuel assembly with reactor coolant.



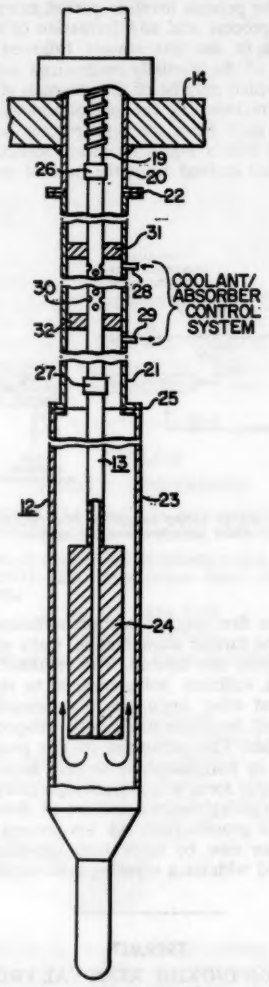
T909,020

COMBINED SOLID AND LIQUID SYSTEM FOR CONTROLLING NUCLEAR REACTORS

Reinhard Froelich, Scottdale, and Howard W. Yant, Greensburg, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1972, Ser. No. 267,812
Int. Cl. G21c *17/10*
U.S. Cl. 176—86 R
2 Sheets Drawing. 16 Pages Specification

A control system for a nuclear reactor comprising hollow mechanically operated control rods and a liquid neutron absorber which may be circulated through the hollow control rods. The liquid neutron absorber provides the nuclear reactor with a redundant safety system to deactivate the reactor.



T909,021

CIGARETTE FILTER

John E. Kiefer, Proffit Acres, Kingsport, Tenn. 37663, and Robert C. Mumpower II, 2104 King Mill Pike, Bristol, Va. 24201

Filed Aug. 24, 1972, Ser. No. 283,459
Int. Cl. A24b *15/02*; A24d *1/06*
U.S. Cl. 131—267
No Drawing. 6 Pages Specification

This invention relates to a new and improved cigarette filter made from a crimped textile tow. The fibers within the filter are coated with a solution of glycerol and poly-(ethylene glycol). The function of the coating, or additive, is to increase the efficiency of the filter for removing tar and nicotine from cigarette smoke. By appropriate choice of glycerol and poly(ethylene glycol) concentration on the fiber, the amounts of both tar and nicotine delivered by a filter cigarette can be adjusted over a significant range.

T909,022
INTERIMAGE EFFECTS IN PHOTOGRAPHIC COLOR ELEMENTS

James Leo Graham, % Eastman Kodak Company, Kodak Park Division, 1669 Lake Ave., Rochester, N.Y. 14650

Filed Sept. 21, 1972, Ser. No. 290,934
Int. Cl. G03c 7/16
U.S. Cl. 96—22
No Drawing. 18 Pages Specification

Processes for providing multicolor photographic reproductions wherein silver images are developed in exposed photographic elements having at least two superposed hydrophilic colloid layers containing silver halide, and forming differently colored dye images in proportion to the silver images. This invention provides an improvement in such processes whereby undercut interimage effects are obtained in at least one of the dye images. These undercut interimage effects are obtained by introducing a compound selected from the group consisting of 2,3-dimethylthiazolium salt, S-β-hydroxyethylthiourea, 1-(2-mercaptoethyl)-1,4,4-trimethyl piperazinium salt, 2-thiobarbituric acid and 6-β-carboxyethyl - 4 - hydroxy-2-mercaptopyrimidine.

T909,023
INTERIMAGE EFFECTS IN PHOTOGRAPHIC COLOR ELEMENTS

Thomas J. Murray, % Eastman Kodak Company, Kodak Park Division, 1669 Lake Ave., Rochester, N.Y. 14650

Filed Sept. 21, 1972, Ser. No. 290,936
Int. Cl. G03c 7/16
U.S. Cl. 96—22
No Drawing. 19 Pages Specification

Processes for providing multicolor photographic reproductions wherein silver images are developed in exposed photographic elements having at least two superposed hydrophilic colloid layers containing silver halide, and forming differently colored dye images in proportion to the silver images. This invention provides an improvement in such processes whereby undercut interimage effects are obtained in at least one of the dye images. These undercut interimage effects are obtained by introducing a compound selected from the group consisting of allyl thiourea, N,N'-bis(2-hydroxyethyl)dithiooxamide, β-mercaptoethanol, β-hydroxyethylisothiouronium nitrate, mercaptosuccinic acid, o-mercaptobenzoic acid. 5-ethyl-5-methyl-4-thiohydantoin, 2-thiouracil, 2-thioorotic acid, 1-acetyl-2-thiourea, 1-acetyl-2-thiohydantoin and 2-mercaptobenzothiazole.

T909,024
POLYMERIC COMPOSITIONS

James L. Suggs, 4241 Maplewood St., Kingsport, Tenn. 37660

Filed Oct. 2, 1972, Ser. No. 294,416
Int. Cl. C08g 17/10
U.S. Cl. 260—861
No Drawing. 13 Pages Specification

Polyesters of 2,2,4-trimethylpentane-1,3-diol, an ethylenically unsaturated acid or anhydride such as maleic, and a polyhydric compound containing at least three hydroxyl groups are used with a vinyl monomer such as styrene, which is a solvent for the polyester, as a general purpose resin. The polyester is prepared with relatively little decomposition of the diol. The unsaturated polyester-vinyl monomer solution may be used as a general purpose resin for castings, coatings and the like by copolymerization using metal promoted, organic peroxide initiator systems at room temperatures. The polyol is present in amounts of from about 1 to about 30 mole percent, based on the combined moles of the polyol and diol. The polyester is present in the composition in amounts between about 40% and about 70% and the vinyl monomer in amounts of between about 60% and about 30%, by weight based on the total weight of the composition.

REISSUES

APRIL 17, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

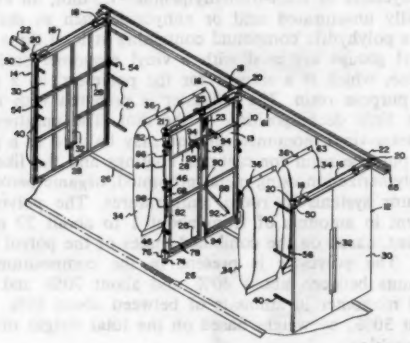
27,615
INFLATABLE BULKHEAD FOR RAILROAD CAR

Neuberne H. Brown, Jr., Colts Neck, N.J., David P. Butler, New City, and Jack M. Carter, White Plains, N.Y., Michael Ferik, Metuchen, N.J., and Paul E. Ogle, Elmwood Park, Ill.; said Frank assignor to said Ogle and said Brown, said Butler and said Carter assignors to General Foods Corporation

Original No. 3,427,997, dated Feb. 18, 1969, Ser. No. 639,696, May 19, 1967. Application for reissue Feb. 3, 1971, Ser. No. 112,440

Int. Cl. B60p *7/14*; B61d *45/00*

U.S. Cl. 105—369 BA 15 Claims



This specification discloses inflatable cushioning bulkheads for protecting lading in a freight car by locking the lading against the end of the car or against another of the bulkheads. Each bulkhead consists of three rigid panels made from sheet metal, plywood, or the like, mounted on a frame with inflatable rubber bags sandwiched between the center and each of the end panels. The bulkhead may be expanded many times its original thickness by inflating the bags. The end panels are free to move toward and away from the center panel which is fixed to the car. The bags cushion the lading with a resilient resisting force which increases with the load imposed on the outer panel by the inertia of the lading. Links maintain the panels in parallel relation in all positions, from fully closed to fully opened. Means in the form of a pipe accessible through the end panels is provided to actuate latches at the top and bottom of the center panels to lock the center panel to the car. The same pipe is also used to conduct air to the inflatable bags and is accessible at the edge of the center panel. In an alternative form the center panel is built into the car as a stationary load bearing member.

27,616
PROTECTIVE DEVICE FOR FIRE HYDRANTS

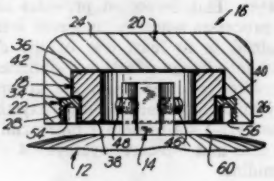
Raul Ralph Diaz, Brooklyn, N.Y., assignor to Angelo Soto, Brooklyn, N.Y.

Original No. 3,556,131, dated Jan. 19, 1971, Ser. No. 756,214, Aug. 29, 1968. Application for reissue Feb. 1, 1971, Ser. No. 111,776

Int. Cl. F16k *35/06*

U.S. Cl. 137—382.5 2 Claims

A device is provided for preventing the unauthorized operation of fire hydrants by concealing the hexagonal member or nut which permits the operation of the fire hydrant and permitting only a limited access thereto. The nut is concealed by connecting thereto a first member which is fixed thereon both axially and rotatably and by



supporting on this first member a freely rotatable member which conceals the first member and prevents a rotative force from being applied to the nut. A special wrench is provided which enables authorized engagement of the nut through the limited access which is provided.

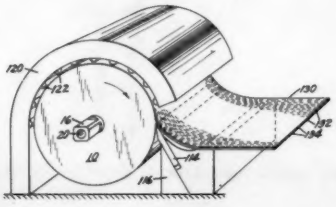
27,617
LOUVERED TRANSPARENT SHEETING MADE BY SKIVING

Frederick O. Olsen, Oakdale Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,524,789, dated Aug. 18, 1970, Ser. No. 660,754, Aug. 15, 1967. Application for reissue Jan. 21, 1971, Ser. No. 108,665

Int. Cl. B32b *31/00*; B44f *1/00*

U.S. Cl. 161—6 12 Claims



Skiving of a laminated billet having opaque layers while heating the surface provides a web with longitudinal louver-like elements. The surface is polished.

27,618
ROBBERY PROTECTION SYSTEM AND DEVICE FOR TEMPORARILY DISABLING A ROBBER AND VISIBLY MARKING HIS LOCATION

Harold J. Robeson, 2104 Clairmont Terrace, Atlanta, Ga. 30345

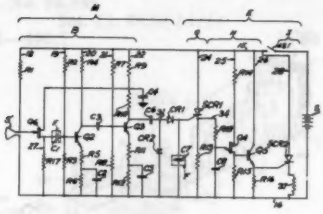
Original No. 3,564,525, dated Feb. 16, 1971, Ser. No. 668,903, Sept. 19, 1967. Application for reissue Feb. 3, 1972, Ser. No. 223,344

Int. Cl. G08b *13/24*; H04b *7/00*

U.S. Cl. 340—224 11 Claims

The present invention relates to a robbery protection system and device for temporarily disabling and visibly

marking the location of a robber after his departure from the robbed premises and includes a transmitter for emitting an electric field in the proximity of the escape path of the robber, and a dummy packet of currency having concealed therein a disabling and marking charge as well as means for activating said charge upon detection of said electric field.



27,619

AMMONIUM NITRATE-ALKALI METAL NITRATE EXPLOSIVE CONTAINING ALUMINUM OF PARTICULAR SIZE DISTRIBUTION

Charles H. Grant, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original No. 3,307,986, dated Mar. 7, 1967, Ser. No. 419,262, Oct. 16, 1964, which is a continuation-in-part of Ser. No. 299,115, July 31, 1963. Application for reissue Aug. 4, 1969, Ser. No. 860,444

Int. Cl. C06b *1/04*

U.S. Cl. 149—21 10 Claims

1. A water resistant metallized, flowable explosive composition which comprises on a weight basis;

(a) to about 60 percent alkali metal nitrate,

(b) from about 10 to about 85 percent ammonium nitrate,

(c) from about 5 to about 25 percent water,

(d) from about 0.2 to about 1.5 percent of a member selected from the group consisting of water swellable gelling and thickening agents, and

(e) from about 5 to about 40 percent particulate aluminum, said aluminum ranging in size from about 4 to about 150 mesh U.S. Standard Sieve and having a gauge of from about 0.025 to about 30 mils and being further characterized in having a particle size distribution wherein from about 60 to about 80 percent is from about 12 to about 50 mesh the balance being substantially 50 to 100 mesh and wherein from about 5 to about 10 percent of the particles have a maximum gauge of about 1 mil, from about [10] *70* to about 80 percent have a gauge of from 1 to about 10 mils, balance ranging from 10 to about 30 mils in gauge.

27,620

COUPLING LINK

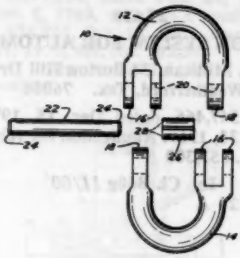
Edward J. Crook, Jr., Wayne, Ind., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Original No. 3,453,822, dated July 8, 1969, Ser. No. 609,636, Jan. 16, 1967. Application for reissue June 28, 1971, Ser. No. 157,779

Int. Cl. F16g *13/06, 13/08*

U.S. Cl. 59—85 7 Claims

A coupling link having two identical half links having mating ears held together by a uniform diameter pin. A uniform dimension spring steel longitudinally split locking sleeves having a lesser nominal inner diameter than the pin is in clamping relation with the pin to virtually fill the space between the spaced ears. The pin is driven longitudinally through the ears and into the end of the sleeve to assemble the link and out of the ears and sleeve to disassemble the link.



27,621

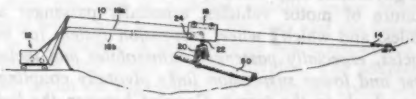
LOG YARDING SYSTEM

Maurice J. McIntyre, Coquitlam, British Columbia, and David G. Rennie, Burnaby, British Columbia, Canada, assignors to Skagit Corporation, Sedro Woolley, Wash.

Original No. 3,407,942, dated Oct. 29, 1968, Ser. No. 618,022, Feb. 23, 1967. Application for reissue July 18, 1969, Ser. No. 853,558

Int. Cl. B66c *19/00*

U.S. Cl. 212—84 20 Claims



A system of yarding logs wherein a log grapple is rigged to inhaul and outhaul lines extending between a yarding tower and the outlying outhaul tail block. The grapple can be suspended from a carriage and the carriage carried by the outhaul line or by a separate skyline. The grapple can be a two line, tag line-operated grapple or a single line grapple. In addition, a log yarding system may be provided with a carriage riding on a suspending line and rigged with a two-part inhaul line with a tag line connected to one part of the two-part inhaul line and extended through the carriage to a log engaging means.

27,622

NEW 5H-DIBENZ (B,F)AZEPINE DERIVATIVES

Walter Schindler and Hans Blattner, Basel, Switzerland, assignors to Ciba-Geigy Corporation

No Drawing. Original No. 3,501,459, dated Mar. 17, 1970, Ser. No. 564,004, July 11, 1966, which is a continuation-in-part of Ser. No. 399,120, Aug. 25, 1964, which in turn is a division of Ser. No. 242,719, Dec. 6, 1962. Application for reissue Sept. 23, 1971, Ser. No. 183,235

Claims priority, application Switzerland, Apr. 17, 1962, 4,683/62; July 13, 1965, 9,799/65; July 26, 1965, 10,446/65

Int. Cl. C07d *41/08, 57/00;* A61k *27/00*

U.S. Cl. 260—239 D 39 Claims

10-aminoalkyl-5H-dibenz[b,f]azepines and the corresponding 10,11-dihydro compounds, optionally bearing an

alkyl substituent in the 5-position, possess pharmacological properties, e.g., they are antidepressants.

27,623

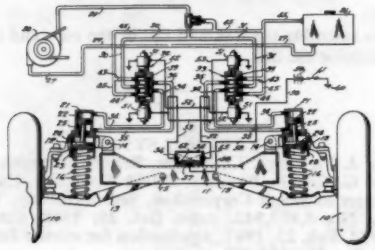
SUSPENSION SYSTEM FOR AUTOMOBILES

Joel C. Millican, 34 Burton Hill Drive, Weatherford, Tex. 76086

Original No. 3,547,466, dated Dec. 15, 1970, Ser. No. 795,540, Jan. 31, 1969. Application for reissue June 15, 1971, Ser. No. 153,300

Int. Cl. B60g *11/00*

U.S. Cl. 280—124 A **8 Claims**



A [hydraulic suspension system for stabilizing the body structure of motor vehicles, especially passenger automobiles, and which] *wheel suspension system for motor vehicles, especially passenger automobiles and including upper and lower suspension links pivotally coupling the front wheels to the frame. Coupled between the links is a coil spring. The suspension system* is semiautomatically controlled by a system of hydraulic cylinders and pistons, the valves of which are activated by electrical circuits which are opened and closed by the motion of the vehicle body occasioned by road surface irregularities and lateral momentum due to deviations in the direction of travel, such as at curves and angular turns in the road.

27,624

CARRIER CARTON

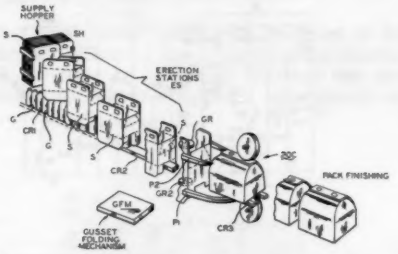
Charles Robert Helms, Barto, Pa., assignor to Container Corporation of America, Chicago, Ill.

Original No. 3,627,193, dated Dec. 14, 1971, Ser. No. 30,917, Apr. 22, 1970, which is a continuation-in-part of Ser. No. 754,331, Aug. 21, 1968, and a division of Ser. No. 863,049, Oct. 2, 1969. Application for reissue Mar. 29, 1972, Ser. No. 239,416

Int. Cl. B65d *5/02, 75/00*

U.S. Cl. 229—37 R **22 Claims**

A discrete group of articles, such as cans or bottles, are enclosed in a carrier sleeve. The articles are arranged in a double row in a carrier sleeve or a basket style carrier, both having gusset folded bottom closure panels. The carriers are applied to container groups in the form of a sleeve as the group moves from a first conveyor reach having a width substantially equal to the width of the double row, and on to a second conveyor reach substantially less in width than the first reach. The sleeve forming the carrier being adapted to move into position around the container group as it moves from the first reach to the second reach to hold the articles stably in the carrier. The sleeve has lower closure elements



adapted to embrace the second reach, and structure is provided for moving the lower closure elements into position against the bottom of the group as the group moves from the second reach to a third reach.

27,625

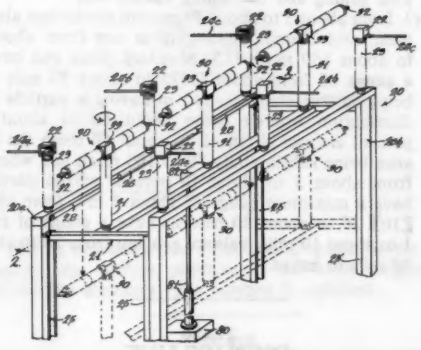
ISOLATING CIRCUIT BREAKER

Donald E. Weston, East Sebago, Maine, assignor to H. K. Porter Company, Inc.

Original No. 3,566,055, dated Feb. 23, 1971, Ser. No. 775,660, Nov. 14, 1968. Application for reissue Oct. 29, 1971, Ser. No. 193,836

Int. Cl. H01h *31/00*

U.S. Cl. 200—48 SB **30 Claims**



High tension electric circuit breaker comprising the combination of interrupter switch means and disconnect switch means so combined as to perform the functions of a high capacity circuit breaker, and also to perform the usual functions of a disconnecting switch, whereby to provide a single switch of novel structure attaining all of the functions of prior art circuit breakers, interrupters and disconnect switches.

27,626

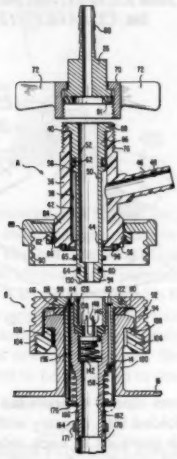
BEER TAPPING DEVICE

Mack S. Johnston, Encino, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Original No. 3,353,724, dated Nov. 21, 1967, Ser. No. 502,091, Oct. 22, 1965. Application for reissue Nov. 18, 1970, Ser. No. 90,885

Int. Cl. B65d *83/14*

U.S. Cl. 222—400.7 18 Claims



Disclosed is a tapping device for beer kegs and the like and, more particularly, a probe adapter for installation in a beer keg opening. The adapter is provided with a liquid valve opened when a probe is inserted into the adapter. Also forming a part of the adapter is a positive acting gas valve which has a closure member moved by the probe to permit gas to flow into the keg through the adapter. The gas flow path through the adapter is at all times separated from the liquid flow path.

27,627

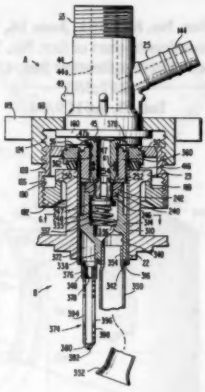
BEER TAPPING DEVICE

Mack S. Johnston, Rolling Hills, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Original No. 3,497,114, dated Feb. 24, 1970, Ser. No. 773,380, Nov. 5, 1968, which is a continuation-in-part of Ser. No. 676,291, Oct. 18, 1967. Application for reissue Dec. 31, 1970, Ser. No. 103,352

Int. Cl. B67d *5/54*

U.S. Cl. 222—400.7 17 Claims



Disclosed is a beer tapping device including an improved adapter for attachment in the beer outlet of a standard keg. The adapter is an all-metal brazed construction insertable from outside the keg with laterally offset liquid and gas passageways terminating within the keg. Also disclosed is a novel metallic valve retainer assembly which also segregates the beer and gas passageways in the adapter. A novel double seal construction on the coupling unit probe is also provided. The adapter is retained about the keg opening by an annular collar which is formed of tubular stock parts brazed one to the other. The adapter body is comprised of parts also formed from tubular and bar stock whereby an all-metal brazed and comparatively inexpensive construction is afforded.

PATENTS

GRANTED APRIL 17, 1973

GENERAL AND MECHANICAL

3,727,235

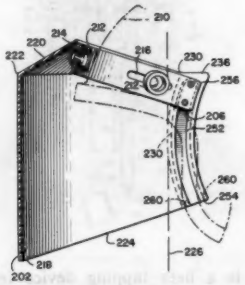
RETRACTABLE FACE PROTECTIVE ASSEMBLY

John Fisher, Dover, Del., assignor to ILC Industries, Inc., Dover, Del.

Continuation of Ser. No. 833,551, June 16, 1969, abandoned, which is a continuation-in-part of Ser. No. 719,183, April 5, 1968, abandoned. This application Jan. 13, 1972, Ser. No. 217,558

Int. Cl. A61f *9/04*

U.S. Cl. 2—10 **7 Claims**



Retractable face protective assembly, having a face shield and means to mount it on a support to be worn on the head. The mounting means are oppositely opposed guide means fixed or removably fixed on the support. A pair of tracks, one at each side of the shield, are adapted to frictionally slide about the guide means which sliding action directs shield movement for selective repositioning and holding the shield at desired positions relative to the support with shield movement controlled by its continuous sliding over the guide means when positioning force is applied to the shield.

3,727,236

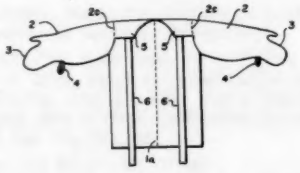
DISPOSABLE APRON

Kenneth F. Lloyd, 3243 Perkiomen, and Michael G. Sirak, 333 South 16th Street, both of Reading, Pa.

Filed June 15, 1971, Ser. No. 153,342

Int. Cl. A41b *13/04*

U.S. Cl. 2—51 **4 Claims**



This invention relates to an economical disposable apron preferably of paper, having integral sleeves and mittens to which are attached elastic loops which may be slipped over the wrists so as to adjust the mittens, as well as the length of the sleeves, to the sizes of the wearer. Shoulder extensions are provided for engaging the back of the shoulders of the wearer to provide a large frictional area of contact to keep the shoulder portions in place.

3,727,237

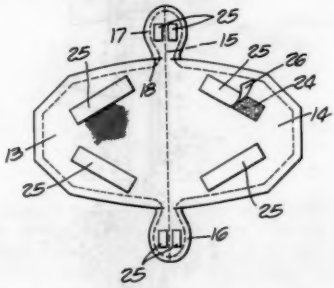
UNDERARM SHIELD

Linda R. Glatt, 2759 Monte Mar Terrace, Los Angeles, Calif.

Filed June 23, 1971, Ser. No. 155,945

Int. Cl. A41d *27/12*

U.S. Cl. 2—56 **2 Claims**



A one-piece dress shield is provided having symmetrical halves which are folded into registry with one another during use. Peripheral tab portions at each side of the fold line include adhesive on the surfaces facing the clothing for securement thereto and also serve as guides during emplacement in a garment. Additional elongated, peelable adhesive means on the main shield body are arranged to extend along the same general direction as the body edges and spaced inwardly therefrom. The shield body and tabs are formed from a plurality of identically shaped layer elements sandwiched together and edge sealed.

3,727,238

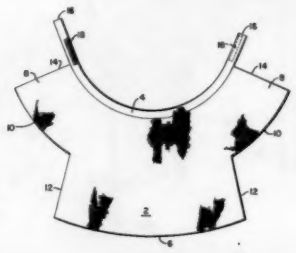
GARMENT FOR INVALID

Bernard R. Wolfson, 9207 Watson Road, Silver Spring, Md.

Filed Nov. 14, 1969, Ser. No. 876,884

Int. Cl. A41d *9/00*

U.S. Cl. 2—69 **7 Claims**



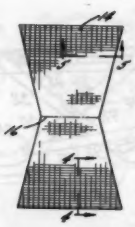
A novel garment is disclosed for particular use by invalids, comprising a full front and a partial back extending from above the wearer's hips upwardly to the waist or shoulders. In a preferred embodiment, the invention comprises a skirt-like garment having a front skirt panel resembling in appearance the front of a conventional skirt, and side panels substantially encircling the wearer's body above the hips. The front skirt and side panels terminate at their upper edges in a waist-encircling waistband having means to secure the ends thereof to each other and thus maintain the garment in position.

3,727,239

INEXPENSIVE CUFFS FOR DISPOSABLE GOWNS

Lenore E. Thompson, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 5, 1971, Ser. No. 140,442
Int. Cl. A41b 7/00
U.S. Cl. 2—123 6 Claims



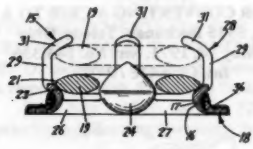
A stretchable, nonwoven cuff for use on articles of disposable apparel, such as industrial garments or hospital gowns or the like is disclosed. The cuff material is comprised of a scrim applique laminated to a stretchable polymeric foam while in a stretched condition. A sheet of material is folded onto itself so that the foam layers are in face to face contact. The folded sheet is then placed into a generally cylindrical shape and the sides are attached to one another with the end opposite the fold line being adapted to be attached to the article of apparel.

3,727,240

SUTURING MEMBER FOR IMPLANTABLE DEVICES SUCH AS HEART VALVES

Francis W. Child, Maple Plain, Minn., assignor to Medical Incorporated, Minneapolis, Minn.

Division of Ser. No. 817,988, April 21, 1969, Pat. No. 3,623,212. This application Oct. 22, 1971, Ser. No. 191,617
Int. Cl. A61f 1/22
U.S. Cl. 3—1 10 Claims



A suturing member associated with an implantable device, as a heart valve, for accommodating sutures to join the device to living tissues. The suturing member has a porous fabric cover surrounding a semi-rigid core of plastic material. The outer surface of the plastic material is bonded to the inner surface of the fabric cover.

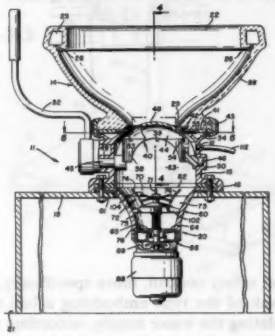
3,727,241

SOIL PUMP SEWAGE HANDLING SYSTEM, METHOD AND TOILET APPARATUS ADAPTED THEREFOR

Alfred J. Drouhard, Jr., and John R. Weeks, Jr., both of Mansfield, Ohio, assignors to Mansfield Sanitary, Inc., Perrysville, Ohio

Filed Oct. 19, 1970, Ser. No. 81,748
Int. Cl. E03d 1/00, 3/00, 5/00
U.S. Cl. 4—10 2 Claims

A sewage handling system, a toilet apparatus and a method by which waste may be pumped through a conduit of relatively small internal diameter. Heterogeneous mixtures of waste and flush fluid are emptied through a drain in the bowl portion of the toilet apparatus into a conically blending chamber therebeneath. Blade means are rotated at high speed within the blending chamber to transform the heterogeneous mixture into a homogeneous slurry that is easily transferred through the conduit into the holding tank by a pump means. A common motor drives both the blade means and the pump means, but in order to use a pump means that is low on power consumption some means must be employed to interrupt rotation of the blade means sufficiently to permit the homogeneous slurry to exit from the blending chamber and flood the intake off the pump means. In one embodiment of the invention disclosed this is accomplished by employing a clutch selectively to drive the blade means. Of particular suitability to this embodiment a baffle may be interposed between the blade means and the intake of the pump to minimize turbulence in proximity to the pump intake and thereby assure flooding of the pump intake even when rotation of the blade means is not absolutely precluded during the pumping stage of the flush cycle. In another embodiment a timing means deactivates the motor so as to interrupt rotation of the blade means for a predetermined time interval sufficient to permit the homogeneous slurry to pass from the blending chamber into the intake of the pump.

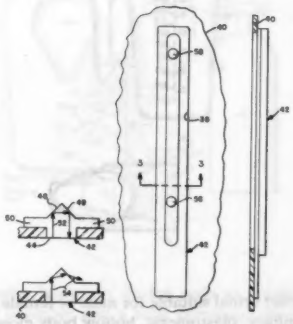


3,727,242

LIQUID LEVEL INDICATION APPARATUS

Marshall W. Miller, Ann Arbor, Mich., assignor to Thetford Corporation, Ann Arbor, Mich.

Filed Sept. 20, 1971, Ser. No. 181,735
Int. Cl. E03d 11/11
U.S. Cl. 4—10 4 Claims



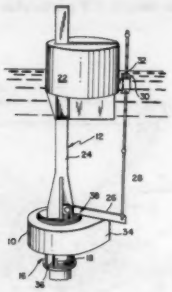
Apparatus for indicating level of liquid in a recirculation type toilet or in other containers or tanks comprising an indicator lens which is free from any moving elements and indicates the level of the liquid by the application of the laws of light refraction.

3,727,243

WATER CLOSET SAFETY CONTROL

Frank D. Biniores, 7827 Arch Street, Little Rock, Ark.

Filed Dec. 30, 1971, Ser. No. 214,277
Int. Cl. E03d 1/36
U.S. Cl. 4—41 6 Claims



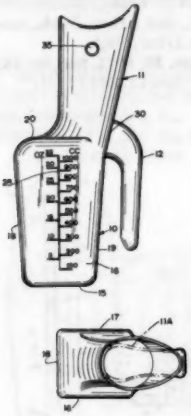
A water closet safety control, more specifically, in a water closet supply tank of the type embodying a ball cock or fill valve float regulating the water supply, according as the level of water rises in the tank, a supplemental safety control operable to insure cutting off the water supply in the event of tank breakage, or other apparatus failure resulting in continued water flow.

3,727,244

DRY CLOSET URINAL

Delmas E. Collins, West Lafayette, Ohio, assignor to Jones-Zylon, Inc., West Lafayette, Ohio

Filed Oct. 1, 1970, Ser. No. 77,185
Int. Cl. E03d 13/00
U.S. Cl. 4—110 2 Claims



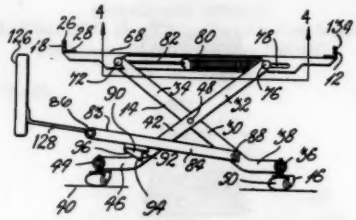
A dry closet urinal suitable for male or female use and comprising a unitary, plastomeric, hollow body closed at one end and having a neck extending from the other end. The neck terminates in a mouth of ovular shape and the neck is resilient and capable of being deformed manually so as to facilitate use of the urinal where a rigid obstruction, such as a traction or body cast, interferes with normal use of the urinal. Upon release, the neck tends to return to its normal shape and thus provides a body seal.

3,727,245

SPRING-UP FURNITURE AND THE LIKE

William Valentine Gerth, 13 Roosevelt Street, Waterloo, Ontario, Canada

Filed July 19, 1971, Ser. No. 163,829
Int. Cl. A47c 17/06; B62b 1/00; A47b 91/00
U.S. Cl. 5—14 5 Claims



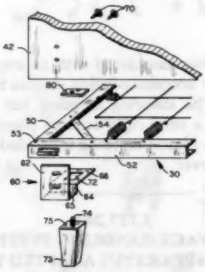
A rollable downwardly collapsible bed is accommodated beneath a combination chesterfield-bed. Straight-line rolling of the former at right angles to the length of the latter to and from its housing is achieved by (i) a set of barrel-shaped castors off-set from swivelling axes thereof so that even if grossly misaligned, an inch or so of horizontal movement rotates them all into parallel rolling posture such as to permit the bed to be rolled in a direction at right angles to its length and (ii) a guide bar having rounded leading corners bearable against the housing side portals which line up the bed for entry between said portals. The rolling bed also includes a cover for said housing when it is accommodated therewithin, said cover being secured to a locking bar by means of which the rollable bed is maintained in raised position. The chesterfield-bed includes adjustable cushioned back rest means (i) whereby standard parallel two-faced cushions may be supported at an angle and afterwards removed for bed use, and (ii) which may be retracted so as not to interfere with use of the bed over its entire width.

3,727,246

DEVICE FOR CONVERTING A CRIB TO A BED

Bernard Germano, 5915 Buchanan, Toledo, Ohio

Filed May 14, 1971, Ser. No. 143,336
Int. Cl. A47c 19/02
U.S. Cl. 5—282 R 5 Claims

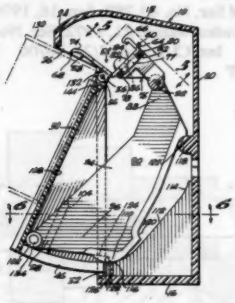


A device for converting a crib to a bed in the form of a spacer bracket with a locking arrangement, which spacer bracket is basically a U-shaped channel member with one vertical side of the channel extending higher than the other such side, the shorter side of the channel member having a perpendicular extension, said higher vertical side having bolt openings therein for attachment purposes to a bed headboard or a bed footboard, and said perpendicular extension of the shorter vertical side having an opening to receive a leg member for a regular bed, and where said perpendicular extension member serves as the vertical support member upon which portions of a bed spring member can rest.

3,727,247
CAN PUNCTURING AND BOTTLE CAP REMOVING DEVICE

Jack Miller, 1410 20th Street, Miami Beach, Fla.

Filed June 28, 1971, Ser. No. 157,293
Int. Cl. B26b 7/44
U.S. Cl. 7—14.25 12 Claims

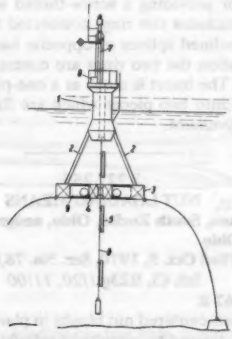


A device, either supported upon a horizontal surface or mounted on a wall, providing a casing and a lever swingable from an outwardly and downwardly projecting attitude to a vertical attitude substantially flush with the front of the housing. When a conventional can is properly positioned against the lever in its angular attitude and pressed inwardly to move the lever to its vertical attitude a puncturing bar swings downwardly to puncture the top wall of the can. When the lever is in its vertical attitude a bottle decapping device, integral with the puncturing bar, is positioned to engage the cap of a bottle to cause removal thereof when the bottle is swung inwardly toward the lever. Cam means are provided in the casing which is operable by the lever to actuate the puncturing bar and bottle decapper and to return the lever to its angular attitude after the can or bottle is removed from the device.

3,727,248
BUOY WITH ADJUSTMENTS FOR THE REDUCTION OF THE EFFECT OF THE SEA FORCES THEREON

Hartmut H. O. Schulze, Hamburg, Germany, assignor to Hagenuk vomals Neufeldt & Kuhnke GmbH, Kiel, Germany

Filed July 7, 1970, Ser. No. 52,844
Claims priority, application Germany, July 18, 1969, P 19 36 558.3
Int. Cl. B63b 21/00
U.S. Cl. 9—8 R 5 Claims

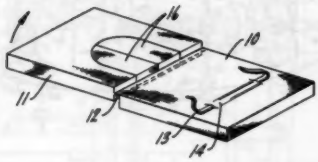


A buoy specifically constructed for reducing the effect of wave and sea forces thereon. The horizontal diameter of the buoy at the surface of the water is relatively small, with the largest, stabilizing part of the displacement volume of the lower part of the buoy being at a water depth in which the amplitude of the vertical oscillations of the water is smaller than the amplitude movement of the buoy. The stabilizing part of the buoy comprises elongated bodies having an essentially horizontal longitudinal axis.

3,727,249
FOLDABLE YOKE LIFE PRESERVER

Bo Bengt Urban Bonthelius, Norr Malarstrand 78, S-112 35, Stockholm, Sweden

Filed March 9, 1972, Ser. No. 233,026
Int. Cl. B63c 9/0
U.S. Cl. 9—312 6 Claims

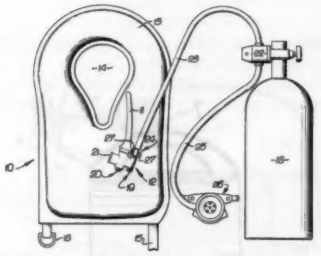


A foldable life preserver is described which is usable as a boat cion. The opening for the head and neck of the user is closed by folding doors to allow the life preserver to be used as a solid cushion in either folded or opened form. The doors swing away in use to expose the opening and to provide additional buoyancy for supporting the wearer in an upright position in the water.

3,727,250
VEST INFLATION/EXHAUST VALVE ASSEMBLY

James P. Koehn, and Edwin M. Bethune, both of North Hollywood, Calif., assignors to Under Sea Industries, Inc., Compton, Calif.

Filed Dec. 2, 1971, Ser. No. 204,204
Int. Cl. B63c 11/18
U.S. Cl. 9—313 10 Claims



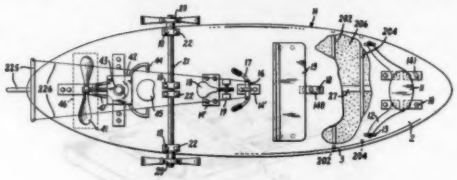
An underwater buoyancy device such as a safety vest includes an air chamber and a tube communicating from the chamber to an inflation/exhaust valve assembly. The valve assembly facilitates vest inflation from a scuba supply tank or exhaustion to vent the air chamber or to permit breathing of air from the device. To this end, the assembly includes in a common housing: a quick-release coupling for a supply tank hose, an inflation valve for controlling air flow from the hose to the vest, a mouthpiece or like outlet, and an exhaust valve to control venting from the vest to the mouthpiece.

3,727,251

BOAT FOR USE AS A LIFEBOAT AND FOR OTHER PURPOSES

Shimon Noyli, General Delivery, U.S. Post Office, 13th & Washington Avenue, Miami Beach, Fla.

Filed June 28, 1971, Ser. No. 157,229
Claims priority, application Israel, July 7, 1970, 34863
Int. Cl. B63c *9/02*
U.S. Cl. 9—3 **15 Claims**



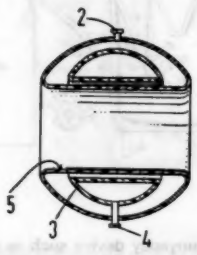
A boat having a double-ended hull of relatively shallow draft which is filled with a material impenetrable to water and having a specific gravity of less than 1.0. The boat hull has a substantially elliptical plan outline and a substantially flat flush deck, the buoyancy of the hull being such that the hull has very little freeboard so that the deck is substantially at water level. Means are embodied in the boat which allow for removably attaching various devices such as propulsion units, deck chairs and the like to the boat deck.

3,727,252

UPPER ARM SWIMMING RING

Heinz Bauermeister, Ottobrunner Strasse 18, Munich, Germany

Filed May 11, 1971, Ser. No. 142,332
Claims priority, application Germany, May 11, 1970, P 20 22 893.7; Sept. 2, 1970, P 20 43 531.8
Int. Cl. B63c *9/08*
U.S. Cl. 9—344 **8 Claims**



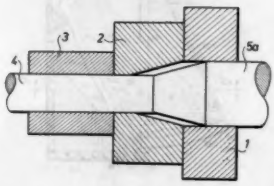
An inflatable upper arm swimming ring is provided with an additional buoyant body so that if air accidentally escapes from the ring there will still be sufficient buoyancy to hold the swimmer's head above the water. This additional buoyant body may be a separate inflatable member or a float.

3,727,253

PROCESS AND AN EQUIPMENT FOR THE PLASTIC FORMING OR SHAPING AND SIMULTANEOUS CHIP-FREE CHOPPING OF METAL BARS AND WIRES

Janos Burany, Erno Csovak, Gabor Gulyas, Jozsef Nemeth, Ivan Vas, Andor Vollak, and Jozsef Erdosi, all of Budapest, Hungary, assignors to Gepipari Technologiai Intezet, Budapest, Hungary

Continuation of Ser. No. 03,287, Jan. 16, 1970, abandoned.
This application March 21, 1972, Ser. No. 236,762
Int. Cl. B21d *53/24, 28/00*
U.S. Cl. 10—86 F **2 Claims**



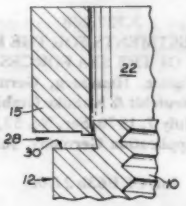
In a process and an apparatus for shearing metal bars under pressure, this bar is at the same time formed by cold flow and the pressure necessary for flowing is used for the purpose of the said shearing too.

3,727,254

METHOD OF FORMING AN INSERT BUSH

John Matthew Tildesley, Wolverhampton, Staffordshire, England, assignor to The Precision Screw & Manufacturing Company Limited, Dillenhall, England

Filed May 5, 1971, Ser. No. 140,538
Int. Cl. B21d *53/24*; **B23p** *19/08*
U.S. Cl. 10—86 R **2 Claims**



An insert for providing a screw-thread when pressed into soft material includes two rings connected together and having external inclined splines of opposite hand, so that in the pressing operation the two rings are contra-rotated, and can lock together. The insert is made as a one-piece construction, and is divided into two pieces which are fixed together, in a single press movement.

3,727,255

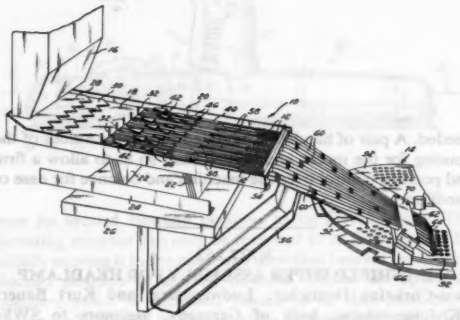
NUT LOADING MEANS

Thomas J. Gruss, South Euclid, Ohio, assignor to Zager, Inc., Cleveland, Ohio

Filed Oct. 5, 1970, Ser. No. 78,031
Int. Cl. B23g *1/20, 11/00*
U.S. Cl. 10—162 R **10 Claims**

Scores of open-centered nut blanks in planar array are to be simultaneously tapped by a multiple spindle tapping head fed by an intermittently advancing train of transfer segments each carrying a planar array of sockets. Nut blanks are loaded in the sockets at a loading station, one transfer segment being loaded during each intermittent advance of the train. The nut blanks are delivered to a plurality of pick-off holders above

the train at the loading station. The pick-off holders comprise side-leaf and top leaf gripping members. The blanks are held forwardly tipped in the feed direction of the train. Prior to receipt of nut blanks, the sockets forming the planar array are penetrated by fingers that are arranged in a corresponding finger array. During the ensuing advance of the segment, together with the fingers, the forwardly tipped nut blanks are



engaged on their rearwardly facing undersides by the fingers and are picked off the holders and guided into the sockets. Each holder is immediately refilled and a number of nut blanks are successively picked off from each pick-off holder during the loading of a single transfer segment. Penetration of the sockets of a particular segment by the fingers is terminated prior to tapping of the nut blanks associated with such segment.

3,727,256

FEED DEVICE FOR LOADING BINDING BARS

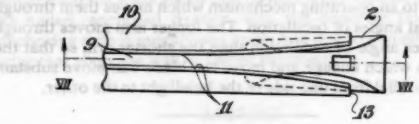
Anthony Howard Gill, Smallfield, near Horley, England, assignor to Arthur Gill (London) Limited, London, England

Filed July 9, 1971, Ser. No. 161,106

Claims priority, application Great Britain, July 22, 1970, 35,503/70

Int. Cl. B42f *1/02*

U.S. Cl. 11—1 R **3 Claims**



A feed device for loading binding bars, comprises a channel member through which the edge of a stack of sheets may be advanced, the member including an insert portion adapted to open the nip of a binding bar on insertion thereinto and a mouth portion for receiving said stack of sheets whereby said stack may be slid into the binding bar.

3,727,257

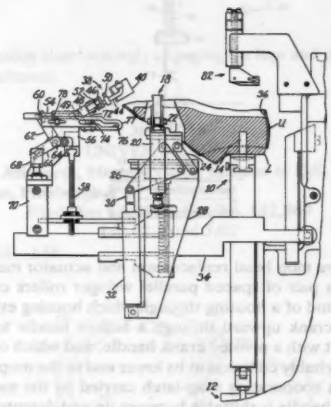
APPARATUS FOR MAKING SHOES

R. T. Pelletier, Beverly, and Karl V. Becker, Topsfield, both of Mass., assignors to USM Corporation, Flemington, N.J.

Division of Ser. No. 2,720, Jan. 14, 1970. This application Jan. 4, 1971, Ser. No. 103,788

Int. Cl. A43d *21/00*

U.S. Cl. 12—10.5 **3 Claims**



Machinery for lasting shoes in which an upper and an insole are assembled on a last with the insole registered on the last bottom at the heel end by the tensioned upper margin and at the toe end by a band. The heel end of the tensioned upper is lasted and secured to the registered insole.

3,727,258

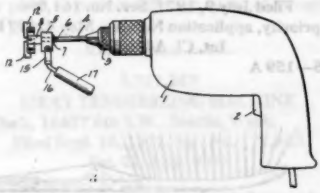
DRILL TOOL ADAPTER

Chris Marion Brueck, P.O. Box 201, Wilton Junction, Iowa

Filed May 13, 1971, Ser. No. 142,929

Int. Cl. A47l *11/14*

U.S. Cl. 15—93 R **8 Claims**



This invention relates to an adapter for portable power drills whereby the same may be used to provide power for operations other than drilling as, for example, for scraping, grinding or buffing. The tool to be used has a shaft which is engaged by the drill chuck and rotatably driven in the usual manner. In order to guide the tool as it is used the shaft rotates in a bearing adjacent the tool and that bearing is, in turn, provided with an handle pivotally secured thereto whereby the tool may be guided while the rotating tool shaft is steadied and prevented from chattering by the additional bearing support.

3,727,259

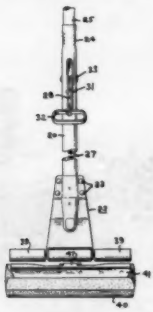
WRINGER MOP HEAD REPLACEMENT AND ACTUATOR MECHANISM

Frank G. Wilson, Grubb Road, Paoli, Pa.

Filed Sept. 28, 1971, Ser. No. 184,517

Int. Cl. A47l *13/144*

U.S. Cl. 15—119 A **1 Claim**



A wringer mop head replacement and actuator mechanism including a pair of spaced parallel wringer rollers carried at the lower end of a housing through which housing extends an operating crank upward through a hollow handle to pivotal securement with a pivoted crank handle, and which operating crank detachably connects at its lower end to the mop head by means of a cooperating snap-latch carried by the mop head. The crank handle is shiftable between up and detented center positions to similarly shift the operating crank and wring out the mop head by passing it between the rollers, and is shiftable to a down position to expel the mop head and lower end of the operating crank from the housing and from between the rollers to completely expose the snap-latch connection for fast mop head replacement. The mop head snap-latch consists of an inverted channel member holding a sponge absorbent element by compression of a marginal edge of the sponge between the channel member walls, the center of the channel base wall having an upstanding tunnel formation into which the operating crank lower end hook arm is slidable with the latter held in position by a shiftable latch plate biased resiliently upward by the sponge material to capture the hook arm.

3,727,260

BRUSH

Baard Spydevold, Oslo, Norway, assignor to A/S W. Jordon Borste & Penselfabrik, Oslo, Norway

Filed July 9, 1971, Ser. No. 161,096

Claims priority, application Norway, May 4, 1971, 1671/71

Int. Cl. A46b *3/16*

U.S. Cl. 15—159 A **1 Claim**

Brush having bristles of different lengths set in pairs.

3,727,261

PLUMBING TOOL

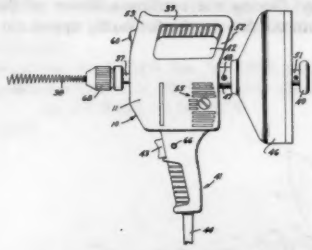
Aaron J. Levine, 3147 N. Cambridge Avenue, Chicago, Ill.

Filed Feb. 17, 1972, Ser. No. 227,229

Int. Cl. B08b *9/02*

U.S. Cl. 15—104.3 SN **11 Claims**

A plumbing tool which is usable in small spaces and which has an electric motor mounted so as to drive a hollow shaft through which a plumber's flexible sewer clean-out rod or other device such as a drill may be extended. A reservoir for the flexible sewer clean-out rod is mounted on the rear of the tool and supplies the flexible sewer clean-out rod to the tool as needed. A pair of handles is mounted on opposite sides of the housing for the motor and hollow shaft so as to allow a firm and positive control over the machine and balance for ease of handling.



3,727,262

WINDSHIELD WIPER ASSEMBLY FOR HEADLAMP

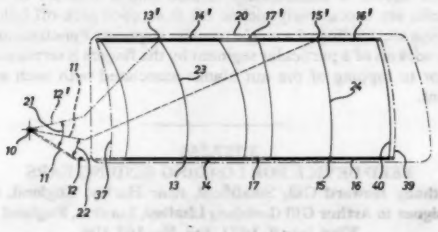
Hans-Christian Deutscher, Ludwigsburg, and Kurt Bauer, Kleiningersheim, both of Germany, assignors to SWF-Spezialfabrik fur Autoyubehor Gustav Rau, GmbH, Bietigham, Germany

Filed Sept. 14, 1971, Ser. No. 180,362

Claims priority, application Germany, Dec. 3, 1970, P 20 59 525.9

Int. Cl. B60s *1/32*

U.S. Cl. 15—250.23 **8 Claims**



A windshield wiper assembly for use in association with a rectangular headlamp includes, a first wiper arm and a second wiper arm shorter than the first pivotally mounted for oscillation about the same pivotal mounting. The arms are connected at their respective outer ends to respective yokes or stirrups which engage the wiper blade. The individual yokes engage the blade at longitudinally spaced locations and the individual wiper blade arms which carry the yokes are connected to an operating mechanism which moves them through different angles of oscillation. The longer arm moves through a smaller angle of oscillation than the shorter arm so that the stirrups which engage and move the blade can move substantially parallel from one side of the headlight to the other.

3,727,263

MULTI-PURPOSE VACUUM CLEANER NOZZLE

Axel Harry Johansson, Enskede, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sept. 24, 1971, Ser. No. 183,510

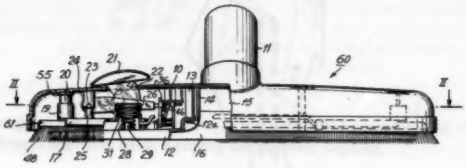
Claims priority, application Sweden, Sept. 30, 1970, 13232/70

Int. Cl. A47l *9/06*

U.S. Cl. 15—373 **8 Claims**

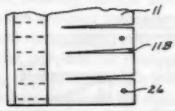
A multi-purpose vacuum cleaner nozzle has a flat surface tool and a brush at the vicinity of a suction inlet for respective-

ly cleaning rugs and floors. The flat surface tool and brush are movable with respect to one another and alternately moved into cleaning position by mechanism having a single operating member movable forward and backward between first and second positions and to which an external force only can be applied in one direction to impart movement thereto from its first to a second blocked position to bring the brush into cleaning position. The operating member cannot be moved directly



from its second blocked position to its first position. The operating member can only be returned to its first position by initially moving it in the same one direction beyond the second blocked position to a third position. When the operating member, which is resiliently biased to its first position, is released after it has been moved to its third position, it can bypass the second blocked position and return to its first position to bring the flat surface tool into cleaning position.

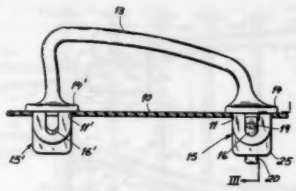
3,727,264
CARPET ANCHORING STRIP
George Porzio, 9 Lakeland Drive, Bricktown, N.J.
Filed July 12, 1971, Ser. No. 161,597
Int. Cl. A47g *27/04*
U.S. Cl. 16—16 **1 Claim**



A carpet anchoring strip for wall-to-wall carpet when laid on a concrete floor which comprises two strips joined together, the one strip of a hardwood providing the pronged holding means for the edge of the carpet and the other strip of a soft, bendable material being adaptable to any irregularity in the concrete surface and easily anchored with metal anchoring nails and also bendable to lift slightly on its forward edge under extreme tensionable pull of the carpet without shearing its nailed, anchored fixation with the concrete floor. The anchoring strip is quickly and easily laid due to a small leading edge that abuts the wall or carpet abutment.

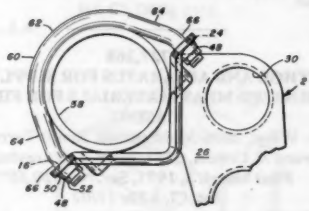
3,727,265
HANDLE CLAMP
Nat Camp, 395 Westchester Avenue, Port Chester, N.Y.
Filed April 8, 1971, Ser. No. 132,410
Int. Cl. A47b *95/02*
U.S. Cl. 16—125 **7 Claims**

A handle to be attached to a lid has a pair of lugs passing through respective slots in the lid, each lug having a bore which lies on the opposite side of the lid upon such insertion and which is formed with a sill rising toward the handle. A pair of generally boot-shaped clips, made like the handle of a resiliently deformable plastic material such as polypropylene, have pointed stems which fit into the bores of the lugs and are provided with reduced portions forming recesses into which the sills may snap when the stems are fully pushed into the



bores, thereby interlockingly engaging the lugs and preventing their withdrawal.

3,727,266
UNIVERSAL HINGE
James E. Ashworth, Moraga, Calif., assignor to U.S. Steel Corporation, Pittsburgh, Pa.
Filed May 13, 1971, Ser. No. 142,869
Int. Cl. E05d *5/02*
U.S. Cl. 16—158 **6 Claims**

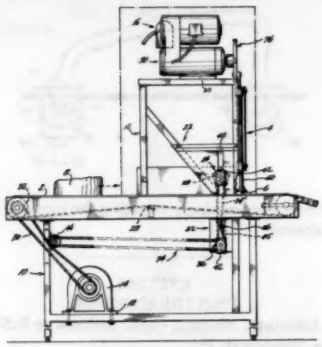


A gate hinge assembly includes a pair of hinge members of opposite hand. Each hinge member includes an L-shaped bracket having at least one outwardly extending bosses in each leg with a hole through each boss, and a hinge plate extending outwardly from one of the legs of the bracket. The gate has a cylindrical upwardly extending projection and a cylindrical downwardly extending projection at one end. Each bracket receives and is fastened to the gate post by means of a bolt passing around the post and through the hole in each leg. Preferably two holes are provided in each leg to permit assembly on posts of different sizes and/or shapes. The cylindrical projections of the gate are received in aligned holes in the top and bottom hinge plates. Two holes may be provided in each hinge plate to permit different types of swinging movement of the gate.

3,727,267
MEAT TENDERIZING MACHINE
Cecil M. Clark, 16457 6th S.W., Seattle, Wash.
Filed Sept. 10, 1971, Ser. No. 179,323
Int. Cl. A22c *9/00*
U.S. Cl. 17—25 **16 Claims**

The machine is equipped with means defining a head which is reciprocable in a vertical plane and has a series of knives thereon that are conjointly reciprocable with the head between upper and lower limits in the plane thereof. It is also equipped with means including a pair of relatively upper and lower feed surfaces which are spaced apart from one another on one side of the plane, and continuously movable in the direction thereof to feed a piece of meat across the plane in a substantially continuously advancing course of travel between the reciprocable limits of the knives. In addition, there are means operable to reciprocate the head in unison with the motion of the surfaces, so that the piece of meat is pierced by the knives in the travel thereof. There are also stripper means

operable to maintain the piece of meat in the course thereof when the knives are retracted from the meat, the knives being arranged in substantially a single row extending parallel to the



plane, so that they pierce progressively rearwardly advanced segments of the piece of meat as they are reciprocated in relation thereto.

3,727,268

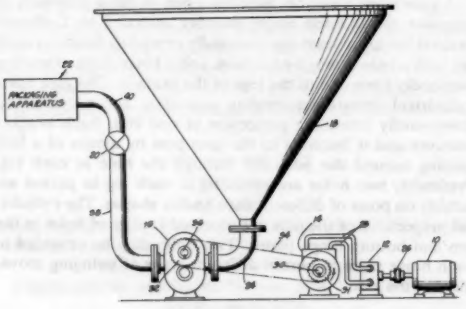
METHOD AND APPARATUS FOR SUPPLYING PRESSURIZED MEAT MATERIALS FOR FILLING A CASING

Ronald O. Wiley, 2086 Middlebrook Road, Torrance, Calif., and Edward A. Urman, 6727 Garth, Los Angeles, Calif.

Filed March 3, 1971, Ser. No. 120,557

Int. Cl. A22c *11/02*

U.S. Cl. 17—35 **5 Claims**



Positive displacement pump for delivering pressurized meat materials to casing filling apparatus is powered by a stallable drive means, such that on changing the casing neither recycling of the pumped materials nor affirmative disconnection of driving power is required.

3,727,269

FISH HOLDER

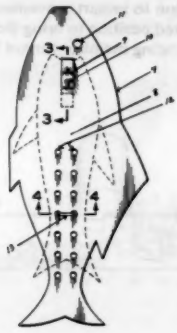
Zudora B. Snead, 736 N. E. 19th Street, Oklahoma City, Okla.

Filed Aug. 24, 1971, Ser. No. 174,409

Int. Cl. A22c *25/06*

U.S. Cl. 17—70 **1 Claim**

A fish-shaped mounting base of board or moulded plastic. Near the head of the fish-shaped base, a metal or plastic hook is attached loosely with a metal screw. The hook rotates on the screw to alternate positions. A large hole extends through the mounting base in the eye position of fish and serves as means for storing by hanging and means for anchorage while in use, when a spike or other holding device (ice pick, for instance) is placed through the hole into a stabilizing surface. A series of small holes are arranged in pairs and placed at regular inter-



vals along the central axis of the mounting base. A four prong holding member is placed in the small holes with sharp points upward and exposed for holding the tail of a fish. A standard ruler stamped on reverse side of mounting base furnishes a convenient method of measure.

3,727,270

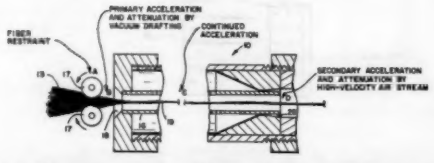
VACUUM DRAFTING OF FIBROUS STRANDS

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Filed July 20, 1971, Ser. No. 164,255

Int. Cl. D01g *25/00*

U.S. Cl. 19—156.3 **4 Claims**


PRIMARY ACCELERATION AND ATTENUATION BY VACUUM DRAFTING
FIBER RESTRAINT
CONTINUED ACCELERATION
SECONDARY ACCELERATION AND ATTENUATION BY HIGH-VELOCITY AIR STREAM

A strand of textile-length fibers is drafted and attenuated by the effect of a vacuum applied at the entrance end of an aspirator nozzle, said strand being accelerated through the body of the aspirator and being further accelerated and attenuated by the action of a high velocity air stream concentric with said tube. The resultant high velocity fibrous stream may be decelerated and diffused in a plenum chamber and removed therefrom as a fibrous web.

3,727,271

FASTENER

Henry Znamirowski, Columbia, Md., assignor to Eastern Products Corporation, Columbia, Md.

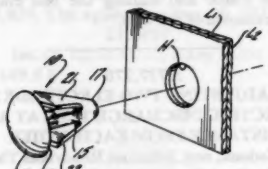
Filed April 12, 1971, Ser. No. 133,217

Int. Cl. A44b *21/00*

U.S. Cl. 24—73 P **4 Claims**

A fastener for fastening together two thin structural layers having registering holes which includes a head, shank, and retention legs integrally molded of resilient plastic, the legs being of V-shape and sprung outwardly in V-configuration to facilitate insertion and each presenting an obtusely angled tip

which is adjacent the head and spaced with respect to the head so that the presented angled edges of the legs symmetrically



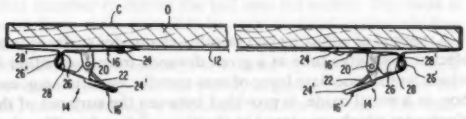
engage the edges of the hole in the adjacent layer to clamp the layers together while keeping the fastener captive.

3,727,272

FLEXIBLE MATERIAL HOLDING DEVICE

Patrick Dey Rhodes, 3258 Richard Avenue N.E., Roanoke, Va.

Filed Oct. 15, 1970, Ser. No. 80,868
Int. Cl. A44b *21/00*
U.S. Cl. 24—81 T 9 Claims



A flexible material holding device comprising: an elastic band and a pair of clips secured to the ends of the band and adapted to engage and removably retain the ends of a flexible material cover for the purpose of removably retaining it in place on an object or objects on which it is mounted. Each of the clips comprises a pair of pivotably connected arms having gripping portions that are biased into engagement by a spring member. The gripping portion of each arm comprises a concave section which merges with a convex end section. The end of the gripping portion of one clip overlaps the end of the gripping portion of the other clip. The concave and convex sections of the one clip are adapted to engage the convex and concave sections, respectively, of the other clip so that flexible material inserted between the gripping portions of the clip arms is gripped in two places by each of the clips. The reverse curvature of the clip arms facilitates the insertion of the flexible material between the gripping portions thereof, prevents tearing of the flexible material retained therebetween, and increases the gripping ability of the clips.

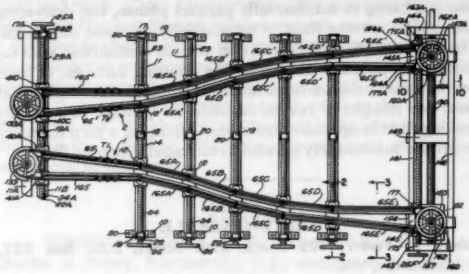
3,727,273

TENTER FRAME

Frederick Hyatt, Providence, and Frederick Earl Arruda, Coventry, both of R.I., assignors to Bevis Industries, Inc., Providence, R.I.

Filed Aug. 17, 1970, Ser. No. 64,303
Int. Cl. D06c *3/02*
U.S. Cl. 26—57 R 5 Claims

The specification discloses a tenter frame of the type which laterally stretches webs of material. The new construction provides for two separate parallel rails, one rail providing a pull track, and the other rail providing a return track wherein the tenter chain is located outside of the oven. In this manner, the tenter chain is exposed to ambient temperatures and cooling during the non-working return cycle. New structures are pro-



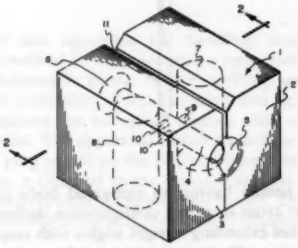
vided at the entering end and delivery end of the tenter frame to accommodate the dual rail structures.

3,727,274

MULTIFILAMENT YARN INTERLACING DEVICE

Ronald E. White, Salisbury, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed April 1, 1971, Ser. No. 130,138
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 10 Claims



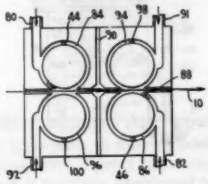
Apparatus and process for efficiently intermingling multifilament yarn by subjecting a yarn bundle to the simultaneous action of two parallel tangential fluid jets and one opposing radial fluid jet, all of the jets being in a common plane which substantially intersects the longitudinal axis of the yarn at right angles.

3,727,275

PROCESS AND APPARATUS FOR INTERLACING STRANDS

Gabriel Ohayon, Lyons, France, assignor to Societe Rhodiaceta, Paris, France

Filed June 17, 1971, Ser. No. 154,136
Claims priority, application France, June 18, 1970, 7022405
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 7 Claims



A process for the production of a multistrand yarn having a coherent structure by interlacing the strands thereof compris-

ing subjecting the strands, while substantially parallel, to the action of a rapidly moving fluid delivered from at least two jets in a zone substantially parallel to the passage of the yarn, the two jets being in substantially parallel planes, but delivering the rapidly moving fluid in substantially opposite directions. The apparatus for the production of such multistrand yarn includes two plates or blocks having abutting surfaces, at least one of the abutting surfaces having recesses therein defining at least two straight or curved conduits for passage of a rapidly moving fluid in opposite directions, impinging a yarn traveling in a plane substantially parallel to the rapidly moving fluid.

3,727,276

FELTING NEEDLE

Edson P. Foster, 409 South 29th Street, P.O. Box 527, Manitowoc, Wis.

Filed April 6, 1971, Ser. No. 131,702

Int. Cl. D04h *18/00*

U.S. Cl. 28—4 N **9 Claims**

A felting needle having an elongated body portion of a quadrangular cross-sectional configuration defined by major and minor axes extending at right angles with respect to each other and having a fiber receiving recess formed on the center line of the minor axis at the lowermost end of the elongated body portion.

3,727,277

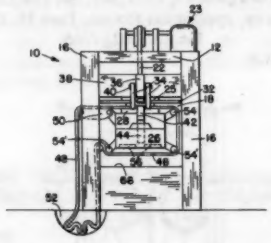
NEEDLE PUNCHING MACHINE FOR ENDLESS WEB AND METHOD OF REMOVING WEB

Edgar C. Rust, Jr., Williamstown, Mass., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed March 25, 1971, Ser. No. 127,976

Int. Cl. D04h *18/00*

U.S. Cl. 28—4 R **12 Claims**



A needle punching machine for manufacturing endless webs wherein a bed beam is releasably mounted on the framework and one end of the framework has an opening large enough for the beam to pass through; and a method of removing the web from the machine which includes the steps of separating the web from the bed beam, supporting the bed beam on bearing means preferably of the "air film" type, releasing the bed beam from the frame and shifting the bed endwise of the frame for easy removal of the web.

3,727,278

METHOD OF ADJUSTING TWO ELECTRODE SURFACES IN AN ELECTRIC DISCHARGE TUBE AT A GIVEN DISTANCE FROM EACH OTHER

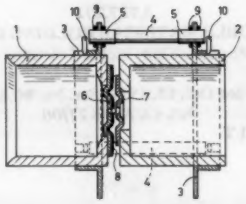
Johannes van Esdonk, and Johannes Hendrikus Theodorus van Roosmalen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1971, Ser. No. 146,108

Claims priority, application Netherlands, June 25, 1970, 7009324

Int. Cl. H01j *9/18*

U.S. Cl. 29—25.16 **4 Claims**



A method of adjusting two metallic electrodes surfaces in an electric discharge tube at a given distance from each other in which an intermediate layer of non-metallic material, e.g. carbon or a metal oxide, is provided between the surfaces of the electrodes which are placed in abutting relationship. The electrodes are then heated to a temperature of about 780°C to connect them with supporting members and cooled. Due to different coefficients of expansion of the electrodes and supporting members, the electrodes separate and the intermediate layer is then removed.

3,727,279

METHOD OF MAKING A PACKAGE SLEEVE BEARING

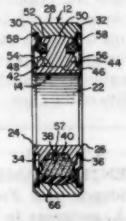
Martin L. Abel, 25235 Canterbury, Franklin, Mich.

Division of Ser. No. 7,032, Jan. 30, 1970, Pat. No. 3,655,249.

This application Oct. 4, 1971, Ser. No. 186,470

Int. Cl. B21d *53/10*

U.S. Cl. 29—149.5 R **1 Claim**



A method of making a package sleeve bearing that includes the steps of providing inner and outer bearing races, cutting a length of rod into a plurality of pieces of predetermined lengths, forming the pieces under pressure into arcuate bearing elements, and assembling the bearing elements between the inner and outer races in a manner to rotatably journal the outer race on the inner race.

3,727,280

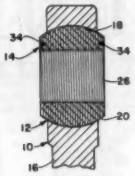
METHOD OF FABRICATING A SPHERICAL BEARING

James R. Campbell, 31301 Camel Point Drive, South Laguna, Calif.

Continuation-in-part of Ser. No. 39,579, May 22, 1970, Pat. No. 3,680,930. This application Dec. 29, 1971, Ser. No. 213,487

Int. Cl. B21d *53/10*; B23p *11/00*

U.S. Cl. 29—149.5 B 12 Claims



The method of fabricating a rod-end bearing comprising a socket member or "banjo" defining an internal annular race of spherically concave curvature, open on both sides, and a spherical bearing member or ball in the socket, in which the socket member is formed in one integral piece with the openings smaller than the diameter of the ball, and the ball is formed as a helix comprising convolutions that are free to deflect and that have outer edges defining a spherically generated surface sized to fit closely within the socket, the ball being inserted by placing one end portion of the helix against one of the openings and relatively rotating the ball and the socket member to thread the ball into the socket. The helix is wound from strip material, by conventional spring-winding techniques, in a cylindrical form which then is spherically machined, or alternatively, is formed by machining a spiral groove around a cylindrical blank, stripping the helix from the flank, and machining a spherical surface thereon. The convolutions are secured together, after the ball is in the socket, by placing a bushing through a bore in a ball and clamping the ball between the ends of the bushing.

3,727,281

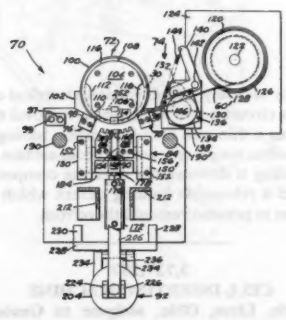
METHOD AND MACHINE FOR MAKING A SLIP LATCH IN A PISTON RING EXPANDER

Donald P. Erickson, and Roy E. Overway, both of Muskegon, Mich., assignors to Sealed Power Corporation, Muskegon, Mich.

Filed July 6, 1971, Ser. No. 160,040

Int. Cl. B23p *19/00*, *19/04*

U.S. Cl. 29—200 B 22 Claims



A method of making a slip latch in a parted corrugated piston ring expander with normally abutting ends and apertured legs in which guides are inserted into selected corrugations to provide a guideway through which the free end of a curved filament is pushed. A machine for performing the method has a locator to hold the expander and a plurality of inner and outer guides extending into the expander to guide the curved filament through the apertures in some of the legs. A feed mechanism pushes a free end of the filament through the expander in cooperation with the guides and into circumferentially spaced left and right hand dies which shear the filament to form a rod of the latch and coin stops on the opposite ends of the rod. The stops retain the latch within the expander and limit the extent to which the opposed ends of the expander can be separated.

3,727,282

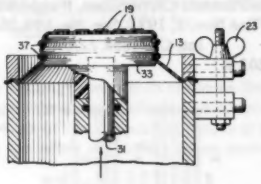
SEMICONDUCTOR HANDLING APPARATUS

Charles A. Neary, Martinsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 5, 1970, Ser. No. 8,851

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 D 6 Claims



A method and apparatus for handling semiconductor crystals. The method includes securing a large semiconductor wafer to a deformable plastic carrier, scribing and breaking the wafer into a plurality of small crystals, and stretching the carrier to separate the individual crystals while maintaining their orientation. The apparatus includes a hollow cylinder, a piston and a plug seated on the piston; the carrier having the wafer thereon is clamped to the cylinder and the piston and plug are moved vertically to stretch the carrier. Then the carrier may be secured to the plug for further utilization.

3,727,283

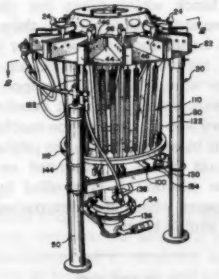
DEVICE FOR USE IN REBUILDING CLUTCHES

James N. Wognum, 9309 South Pleasant Avenue, Chicago, Ill.

Filed June 1, 1971, Ser. No. 148,323

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 J 18 Claims



A device for use in rebuilding clutches which includes a table. The table has a plurality of radially positioned slots, and a plurality of clamping arms is pivotedly connected to the table. Each clamping arm is movably positioned in a respective slot. An arm spring is connected to each of the clamping arms, constantly urging the arms toward the center of the table. An arm positioner is connected to each of the clamping arms for

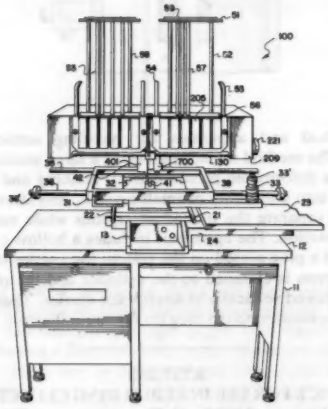
determining the initial or rest position of each of the arms. Each of the arms is connected to an arm actuator, which simultaneously moves all of the arms. A reciprocal spindle is mounted in the center of the table and is surrounded by the clamping arms. A hydraulic spindle cylinder is connected to the spindle for reciprocating the spindle, and a hydraulic actuator cylinder is part of the arm actuator to operate the arms. A positive displacement pump is connected to the hydraulic spindle cylinder and to the hydraulic actuator cylinder. Valving is provided for selectively operating each of the cylinders. A hydraulic circuit is connected between the hydraulic pump and the hydraulic spindle cylinder in parallel with the valving for the spindle cylinder to allow the reciprocation of the positive displacement pump to be transmitted to the spindle through the hydraulic spindle cylinder.

3,727,284

APPARATUS FOR SELECTING AND INSERTING DUAL IN-LINE COMPONENTS

Phillip A. Ragard; Albert W. Zemek; Weibley J. Dean, and Robert H. Holmes, all of Binghamton, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 3, 1971, Ser. No. 195,268
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **27 Claims**



An apparatus for individually selecting a number of dual in-line components and sequentially inserting them into a printed circuit board. The apparatus has a basic mode of operation comprising a group of feed magazines that are adapted to feed a single shuttle block which takes the components by a predetermined sequence and carries them to a transfer mechanism which bends the leads on either side of the component outwardly, transfers the prepared component to an insertion mechanism which forces the component downwardly while simultaneously biasing, but not bending, the leads inwardly. Another portion of the insertion mechanism forces the component with its biased leads into the printed circuit board. The printed circuit board is mounted on a pantograph mechanism whose position is controlled by either a tape reader or a computer which also determines the automatic sequencing of the shuttle block.

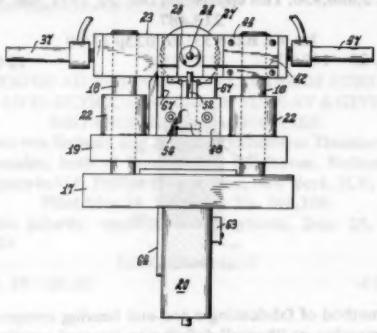
3,727,285

LUGGING MACHINE

Richard H. McFarlane, Geneva, Ill., assignor to Coilform Company, Geneva, Ill.

Filed April 8, 1971, Ser. No. 132,322
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D **8 Claims**

A machine for mounting terminal lugs on the flanged base of a tubular core including automatic feed means for a chain-form of lugs and means to sever said lugs from the chain of lugs one at a time and secure them to the flange. The machine



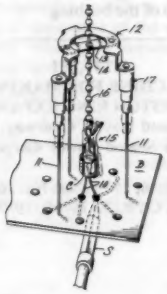
also includes means to index the flange to facilitate selective placement of a predetermined number of lugs on said flange.

3,727,286

ELECTRICAL SERVICING TOOL

James P. Kimmett, 703 Pierce St., Delphos, Ohio

Filed Oct. 7, 1971, Ser. No. 187,367
Int. Cl. H01r *43/00*; **B25b** *27/02*
U.S. Cl. 29—203 H **10 Claims**



A device for securely gripping small electrical components mounted on a circuit board to facilitate removal thereof. The device includes a thin wall annular portion having an interior opening shaped to snugly receive the cross-section of the component by sliding it downwardly over the component toward the board and a releasable locking detent which slips under the component to prevent removal therefrom.

3,727,287

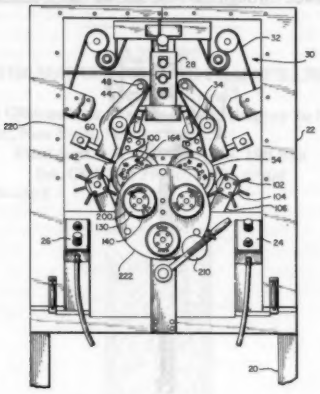
CELL INSERTING MACHINE

Fred R. Davis, Lima, Ohio, assignor to Gasdorf Tool & Machine Company, Inc., Lima, Ohio

Filed July 2, 1971, Ser. No. 159,338
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 E **7 Claims**

Strip feeding apparatus, a cutting mechanism, an insertion

mechanism, a rotatable receiving drum having slots for receiving the cut strips, a rotatable transfer drum, and a push rod ar-



rangement for inserting shaped strips from the slots of the transfer drum into the core slots of a motor.

3,727,288

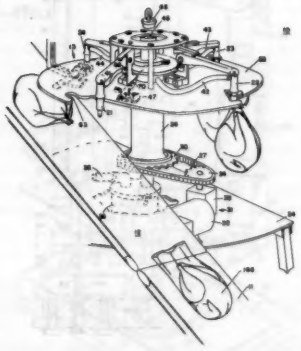
CLIPPING SYSTEM

John T. Roberts, Simpsonville, and Philip L. Reid, Greenville, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 9,868, Feb. 9, 1970, Pat. No. 3,648,430. This application Dec. 15, 1971, Ser. No. 208,502

Int. Cl. B23q 7/10; B23p 11/00

U.S. Cl. 29—211 D **3 Claims**



A device for applying a U-shaped metal clip to a bag wherein two cooperating pivoted closing members having anvil surfaces are caused to receive the clip encircling the neck of the bag by means of camming sockets in a reciprocal plate which also includes provision for the crimping ram.

3,727,289

DEVICE FOR CLAMPING AND MOVING TOGETHER THERMOPLASTIC PIPES FOR FLUSH-WELDING

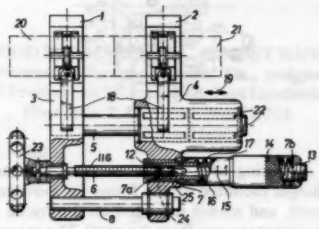
Karl Bemelmann, Bad Soden/TS., and Hubert Koch, Okarhen, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Sept. 3, 1970, Ser. No. 69,357

Claims priority, application Germany, Sept. 18, 1969, P 19 47 285.6

Int. Cl. B23p 19/04; B29c 27/00; F16l 13/02

U.S. Cl. 29—237 **4 Claims**



A device for heating pipes which are to be flush welded includes two hinged clamps each of which is connected to a supporting piece. One of the supporting pieces is attached to a guide pin with the other supporting piece movably mounted thereon.

3,727,290

METHOD FOR PROCESSING HOT-ROLLED METAL BODIES AND THE LIKE

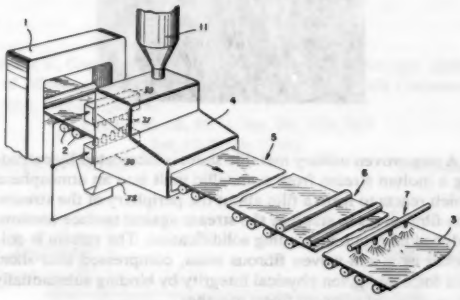
Georges Schaumburg, 1 bis rue de Londres, Montigny-Les-Metz, France

Continuation-in-part of Ser. No. 835,359, June 23, 1969, Pat. No. 3,648,349. This application March 2, 1971, Ser. No. 120,084

Claims priority, application Germany, Nov. 14, 1970, P 20 56 135.7

Int. Cl. B23q 17/00

U.S. Cl. 29—407 **11 Claims**



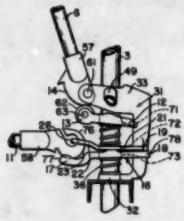
A hot-rolled metal body, e.g. a bar, rod, billet, bloom, rail or wire, emerges from between the last rolls of the rolling-mill train in a hot condition and is subjected to a high-pressure water jet to remove all traces of scale and prepare the surface of the body for receiving an enamel coating without substantial cooling of the body. The workpiece is then coated with a powder fusing at a temperature at or below the temperature of the body to form a liquid layer or film which solidifies upon cooling to provide the enamel coating. Since the enamel coating ruptures, cracks, "stars" or otherwise breaks in the region of surface flaws of the body, the coating serves to indicate the presence of such flaws while protecting the body against oxidation or scaling as the body cools.

3,727,291

UNIVERSAL PRESS

Randall K. Babb, Newark, Calif., assignor to Anthony J. Randazzo and Randall K. Babb, part interest to each

Filed March 24, 1971, Ser. No. 127,711
Int. Cl. B23p *19/02*
U.S. Cl. 29—251 **3 Claims**



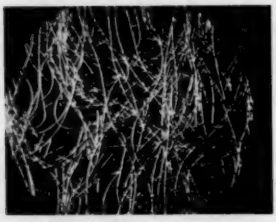
A press consisting of a frame, an anvil mounted on the frame, a plunger mounted on the frame for movement to and from the anvil, and means mounted on the frame for movement of the plunger to and from the anvil. The means for moving the plunger frictionally grips the plunger and is provided with one handle which positively moves the plunger toward the anvil and another handle which positively moves the plunger away from the anvil.

3,727,292

METHOD OF FABRICATING A NON-WOVEN SHEET FROM EXTRUDED METAL FILAMENTS

Doyle C. Nicely, Durham, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 9, 1969, Ser. No. 883,540
Int. Cl. B23p *17/00*
U.S. Cl. 29—419 **10 Claims**



A non-woven unitary metallic sheet is fabricated by extruding a molten stream from a metallic melt into an atmosphere which reacts to form a film about the periphery of the stream. The film serves to stabilize the stream against surface tension-induced disruptions pending solidification. The stream is collected as a non-woven fibrous mass, compressed into sheet like form and given physical integrity by binding substantially all or selected adjacent fibers together.

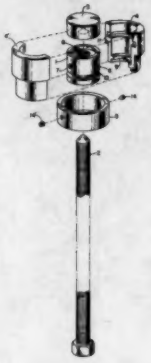
3,727,293

REVERSIBLE PUSHING-TYPE SEPARATION TOOL FOR USE PARTICULARLY WITH AN ICE-MAKING VENDING MACHINE

Ernest L. Phillips, Sr., 107 West Cumberland, Poplarville, Miss.

Filed June 9, 1972, Ser. No. 261,357
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 **4 Claims**

A reversible, pushing-type separation tool for use, for example, in an ice-making vending machine for removing the internal auger from the refrigerator cylinder of the ice-making mechanism. The tool comprises a pushing ram shaft threaded through a short, solid cylindrical anchor block which is easily attached to one end of the refrigerator cylinder by means of a three piece split, flange clamp locking sleeve and, alternately, to the other end with bolts for reversability. The threaded ram shaft is screwed through the solid anchor block attached to the refrigerator cylinder, either directly or through a solid ram block, against the end of the auger, thereby providing mechanical means that will enable a repairman to easily and quickly remove the auger and/or the bearing system from the refrigerated cylinder; as opposed to the hammer and chisel or sledge hammer, brute force technique of the prior art.

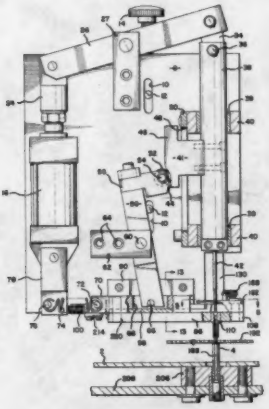


3,727,294

METHOD AND MACHINE FOR FORMING AND INSERTING WORKPIECES IN AN APERTURED WORKPIECE HOLDER

James Ray Coller, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 90,593, Nov. 18, 1970, abandoned.
This application March 20, 1972, Ser. No. 236,515
Int. Cl. B23p *19/00;* **H01r** *43/00;* **H05k** *13/04*
U.S. Cl. 29—429 **10 Claims**



A method and machine is provided to serially supply a plurality of workpieces to a work station where each workpiece is individually subjected to a forming operation that conditions the workpiece for an interference fit when inserted within an aperture of a workpiece holder such as a card or printed circuit board. Each workpiece is individually and sequentially

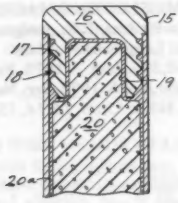
subjected to the forming operation, then segregated from the remaining workpieces and precisely positioned for automatic insertion into the apertured card or board by a transfering mechanism. The occurence of a malfunction in the automatic insertion operation will automatically shut off the machine enabling correction of the malfunction.

3,727,295

METHOD OF MANUFACTURING FOAM FILLED METAL BAT

A. Donald Gildemeister, Toledo, Ohio, assignor to N L Industries, Inc., New York, N.Y.

Filed Sept. 15, 1971, Ser. No. 180,555
Int. Cl. B21d *39/00*; B23p *19/04*
U.S. Cl. 29—455 **1 Claim**



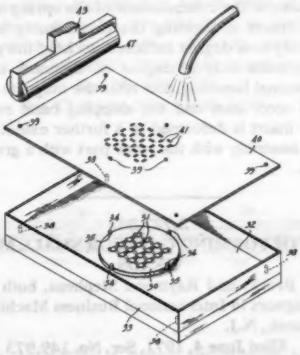
A foam filled metal bat and method for making same are disclosed. The bat comprises a die cast, ball-bat shaped hollow tube of substantially uniform wall thickness having an integrally cast knob over an end of a handle portion. The end of a club portion of the tube is open. A rigid urethane foam extends within the tube from the knob end up to and contiguous with a cap inserted in the open club end. The rigid foam forms a bond with the tube walls and the cap portion which may be a semi-rigid urethane foam or a rubber plug. The method comprises the steps of casting the tube, inserting the cap portion and placing the rigid urethane foam within the tube to form a rigid, lightweight unitary structure. A method and means are also disclosed for locating the center of percussion of the bat in which foams of different densities are placed in the bat.

3,727,296

EXPLOSIVE BONDING OF WORKPIECES

Benjamin Howell Cranston, 67 Kuser Road, Trenton, N.J.

Continuation-in-part of Ser. No. 6,829, Jan. 29, 1970, abandoned. This application Aug. 31, 1970, Ser. No. 68,431
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **9 Claims**



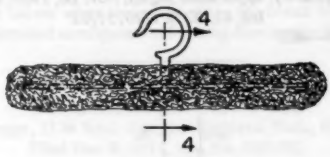
First workpieces, for example, beam-leaded integrated circuits, and the like, are bonded to second workpieces, for example, metallized ceramic substrates by first depositing a quantity of primary explosive, such as lead azide, onto each beam lead and then detonating the explosive to explosively bond the integrated circuits to the substrate. In another embodiment of the invention, the explosive bonding force is applied through a buffer sheet of plastic or metallic material which protects the surface of the substrate from contamination and which, in addition, dampens the shock of the explosion. In yet another embodiment of the invention, metal conductive paths are explosively bonded directly to a ceramic or glass substrate to form a "printed circuit pattern." The same techniques are used to manufacture resistors, capacitors, inductors, etc.

3,727,297

METHOD FOR MAKING A GARMENT HANGER

Fred A. Wesemann, Pompano Beach, Fla., assignor to Consolidated Productions Incorporated, Fort Lauderdale, Fla.

Filed June 2, 1970, Ser. No. 42,704
Int. Cl. B23k *31/02*
U.S. Cl. 29—480 **1 Claim**



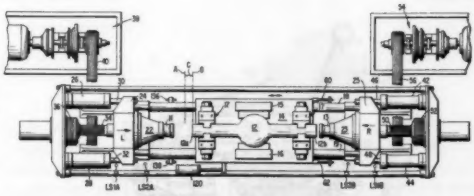
A method for manufacturing plastic articles which consists of twisting a relatively flat strip of plastic so that it is helical in shape, winding the plastic in layers on a holder, sealing the layers together in a narrow longitudinal area while the twisted plastic remains on the holder, adding stiffening means to the plastic while it remains on the holder and passing a cutting element through the plastic in a direction longitudinally along the holder thereby permitting the cut unsealed layers of plastic to flare outwardly so that the stiffening element and heat sealed longitudinal portion constitutes an axis. The elongated articles produced are then folded double and given a twist to produce a clothes hanger when provided with a hook or a brush when provided with a handle.

3,727,298

FRICTION WELDING METHOD

Arthur F. Gage, Warren, and Alex F. Stamm, Rochester, both of Mich., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed June 10, 1971, Ser. No. 151,767
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 **4 Claims**



Method for friction welding two rotating end workpieces to a non-rotatable central workpiece wherein one end workpiece is held axially stationary while the other end workpiece is moved axially into engagement with the central workpiece and then axially displaces the central workpiece into engatement with the one end workpiece. The central workpiece is mounted on a floating table which is axially displaceable to accomplish the described welding cycle.

3,727,299

METHOD FOR MAKING A DENTAL APPLIANCE

Alfred Hoffmann, Erkrath, and Erich Surbach, Essen, both of Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed May 26, 1971, Ser. No. 147,222
Int. Cl. B23k 31/02
U.S. Cl. 29—472.7 3 Claims

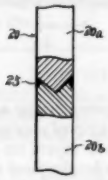
An alloy consisting essentially of 8 to 16 weight-percent chromium, 5 to 15 weight-percent nickel, 1 to 10 weight-percent titanium, remainder cobalt, as a material that can be bonded to ceramic masses by burning, whereby an integrally assembled alloy-porcelain dental applicance is formed for making non-removable dental prostheses.

3,727,300

METHOD OF JOINING CONSUMABLE ELECTRODE IN ELECTROSLAG MELTING

Osamu Madono, Yono, Japan, assignor to Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1970, Ser. No. 88,881
Claims priority, application Japan, Nov. 20, 1969, 44/92506
Int. Cl. B23k 1/20, 31/02
U.S. Cl. 29—483 1 Claim



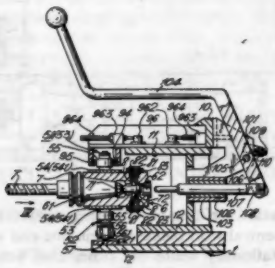
In the ingot moulding by the electroslag melting method of electrodes, preliminarily is formed convex or male screw at the lower end of the upper electrode and concave or female screw at the upper end of the lower electrode, and the electrodes are joined by being connected their ends.

3,727,301

TOOL RESERVING MAGAZINE FOR MACHINE TOOL

Sadaaki Tsuzuki, and Yuzo Honda, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Oct. 22, 1971, Ser. No. 191,685
Claims priority, application Japan, Oct. 23, 1970, 45/105823
Int. Cl. B23q 3/157
U.S. Cl. 29—568 5 Claims



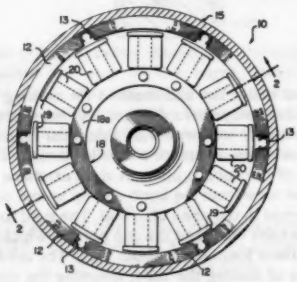
Disclosed herein is a tool take-out apparatus for a tool reserving magazine including a plurality of tool receiver sockets mounted on endless chains stretched over a drive sprocket and guiding pulleys and displaceable tension pulleys for offsetting chain loosening produced in the course of operation time. The tool take-out apparatus comprises guiding track means for regulating moving directions of the endless chains, a supporting member adjustably mounted on the magazine and supporting the track means, adjusting means for properly positioning the supporting member, holding means mounted on the supporting member, a push rod reciprocatably mounted on the holding means with the axial line thereof kept coinciding with that of each of the sockets indexed to the tool take-out position, and operational means for reciprocating the push rod along its axial line.

3,727,302

METHOD OF MAKING AN ANNULAR ASSEMBLY OF MAGNETS FOR USE AS THE FIELD OF A DYNAMOELECTRIC MACHINE

Russell E. Phelon, Rio Piedras, P.R., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Division of Ser. No. 60,296, Aug. 3, 1970, Pat. No. 3,663,050.
This application Jan. 6, 1972, Ser. No. 215,828
Int. Cl. H02k 15/00, 15/14, 15/16
U.S. Cl. 29—596 11 Claims



A method of assembling a plurality of arcuate magnets inside an annular member wherein said magnets are biased towards each other by a resilient member.

A plurality of arcuate ceramic magnets are arranged in a generally end face to end face, spaced relationship to form an annular ring, and a compressible resilient spacer or spring member is placed between two magnets to hold them in assembly with a temporary shipping band or with the rotor part in which they are finally installed. In making the assembly, a deformable insert may also be placed between two adjacent magnets and then deformed to enlarge the gap in which it is received, thereby compressing the spring member. If the magnets are first formed into a preassembly with a shipping band for later assembly with a rotor part, and if a deformable insert is used to control the compression of the spring member, the deformable insert in forming the preassembly is preferably deformed only to a degree sufficient to hold the preassembly in assembly with only a degree of tightness sufficient to withstand normal handling, and after the magnets are inserted in the final rotor part and the shipping band removed, the deformable insert is deformed to a further extent to hold the magnets in assembly with the rotor part with a greater degree of tightness.

3,727,303

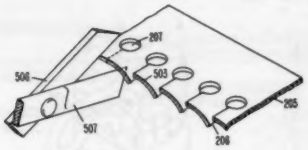
METHOD OF FORMING GAPS FOR SMALL MAGNETIC HEADS

George W. Brock, and Raymond Stephens, both of Boulder, Colo., assignors to International Business Machine Corporation, Armonk, N.J.

Filed June 4, 1971, Ser. No. 149,973
Int. Cl. G11b 5/42; H01f 7/06
U.S. Cl. 29—603 15 Claims

A small multi-element magnetic recording head reads and writes information on magnetic medium information tracks

corresponding to head gaps. The head is a single magnetic strip having a plurality of gaps extending from one edge of the strip to apertures aligned along that edge. Conductors are associated with the apertures. One embodiment of the head is formed by coating the strip with an acid-resistant mask,



punching the apertures, shearing the gap, etching the strip, and annealing the strip. Another embodiment of the head is constructed by wrapping a composite wire around a mandrel and then plating, drilling, and cutting a cross-section of the wrapped wire.

3,727,304

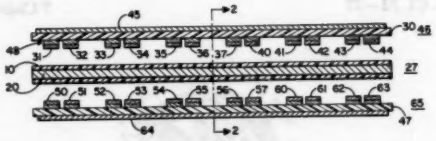
PLATED WIRE MEMORY FABRICATION

Jack L. Granato, and Richard F. Moore, both of Pinellas, Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 688,782, Dec. 7, 1967, abandoned. This application Sept. 28, 1970, Ser. No. 76,004

Int. Cl. H01f *7/06*

U.S. Cl. 29—604 **2 Claims**



A plated wire thin film memory assembly and fabrication method is shown and described wherein the plated wire is contained in a "tunnel structure" sandwiched between layers of a multi-layer printed circuit assembly.

3,727,305

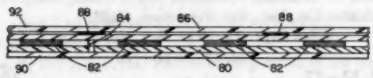
METHOD FOR MANUFACTURING A CONTROL ARTICLE

Irving B. Cooper, Jr., Atkinson, N.H., assignor to Notifier Company, Lincoln, Nebr.

Continuation of Ser. No. 859,602, July 7, 1969, abandoned, which is a division of Ser. No. 776,746, Nov. 18, 1968, Pat. No. 3,564,214, which is a continuation of Ser. No. 481,687, Aug. 23, 1965, Pat. No. 3,508,031. This application Sept. 14, 1971, Ser. No. 180,435

Int. Cl. B41m *3/08*; H05k *3/00*

U.S. Cl. 29—625 **4 Claims**



A process of making a coded circuit card is disclosed wherein a foil sheet is selectively apertured and then overlayed with another such sheet and selective through apertures are formed in the composite. Then the composite is encased in opaque insulative material.

3,727,306

SPOON CONSTRUCTION

Robert M. Patik, 511 Southwest Avenue, Greensburg, Pa.

Filed Dec. 17, 1971, Ser. No. 209,296

Int. Cl. A47j *43/28*

U.S. Cl. 30—149 **12 Claims**

A multi-purpose, one-piece spoon construction of molded plastic including integral bowl and handle portions with a centrally disposed break line extending therealong, and a hinge portion at the end of the handle portion to permit flexing of the spoon halves when separated along the break line to provide a bifurcated configuration for tong-like manipulation.

3,727,307

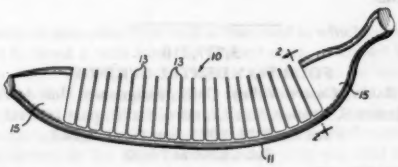
COMESTIBLE SLICING DEVICE

Sol J. Berger, 1116 Kent Avenue, Highland Park, Ill.

Filed Dec. 8, 1971, Ser. No. 205,952

Int. Cl. B26b *3/04*

U.S. Cl. 30—304 **6 Claims**



A slicing device for simultaneously slicing an elongated comestible into a plurality of disks. The slicing device includes a lengthwise flexible supporting strip having a plurality of lengthwise spaced knife blades projecting therefrom.

3,727,308

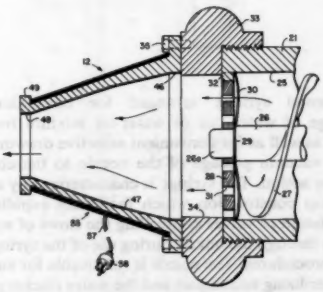
APPARATUS FOR PROCESSING CHEESE

Joseph H. Ross, Hayward, Calif., assignor to Lucky Stores, Inc., San Leandro, Calif.

Filed Feb. 26, 1970, Ser. No. 14,556

Int. Cl. A01j *25/00*

U.S. Cl. 31—89 **5 Claims**



The invention relates to apparatus for processing cuttings and trimmings of cheese to reconsolidate it.

3,727,309

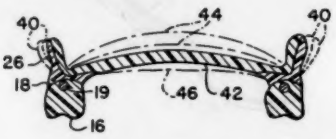
DENTURE AND METHOD

Elbert P. Huey, Scottsdale, Ariz., assignor to Comfo-Dent Corporation of America, Scottsdale, Ariz.

Continuation-in-part of Ser. No. 59,922, July 31, 1970, Pat. No. 3,667,123. This application June 6, 1972, Ser. No. 259,623

Int. Cl. A61c *13/00*

U.S. Cl. 32—2 12 Claims



A prosthetic denture and method of manufacture comprising a set of artificial teeth which are reinforced at their base portions by a U-shaped frame. The set of artificial teeth are bonded to a fairly rigid continuous thermoplastic or thermoset material. As a second stratum another less rigid thermoplastic or thermoset layer is included. The latter layer is deformable to intimately fit the gum area and/or the palatal area of the mouth. The denture is used by placing it in a person's oral cavity and deflecting the less rigid portion into a set to accurately conform with the edentulus ridge in the cavity. The denture may also have a liner directly in abutment with the gum area and/or the palatal area. The liner may be only partially cured plastic material which may be further cured, preferably in place, or it may be a relatively soft thermoplastic material.

3,727,310

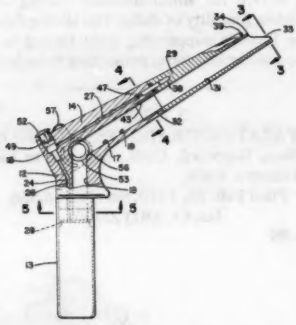
FOUR-WAY DENTAL SYRINGE

Gary Baker, Castro Valley, Calif., assignor to Don A. Patton & James S. Brauer, San Leandro, Calif., part interest

Filed April 21, 1971, Ser. No. 136,143

Int. Cl. A61c *19/02*

U.S. Cl. 32—22 3 Claims



A dental syringe arranged for convenient selective discharge of water, air or water-air mixture from a nozzle thereof as well as for convenient selective drawing of vacuum from a vacuum passage of the nozzle to thereby provide a four-way action. The syringe is characterized by a convenient pistol-grip construction which facilitates expiditious thumb manipulation of valves controlling the flows of water, air and vacuum through the nozzle during use of the syringe in normal dental procedures. The nozzle is removable for autoclaving or other sterilizing techniques and the water discharge opening is centered in an annular air discharge opening, the vacuum opening being separate therefrom and positioned below the air-water arrangement.

3,727,311

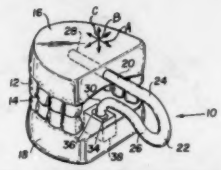
DENTAL ARTICULATOR

Andre T. Schoonebeek, 88 Anderson Avenue, North Babylon, N.Y.

Filed April 27, 1972, Ser. No. 248,232

Int. Cl. A61c *11/00*

U.S. Cl. 32—32 10 Claims



An inexpensive articulator for dental casts and the like utilized in the manufacture of bridges, crowns, inlays, jackets and similar restorations in which the articulator supports the models in a position corresponding to their actual position in the jaws and for movement of the supported models relative to each other and for separation from each other to facilitate the unobstructed accurate shaping and sculpturing of the parts of the restoration.

3,727,312

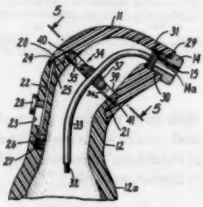
DENTAL HAND INSTRUMENT

Joseph L. Durante, 651 Main Street, N. Hackensack, N.J.

Filed March 15, 1971, Ser. No. 124,210

Int. Cl. A61c *1/10*

U.S. Cl. 32—27 7 Claims



An improved dental hand instrument is provided having means whereby the head of the instrument can be rotated relative to the body thereof so that a dental work piece projecting from the head can be displaced through an arc and positioned at various angles with respect to the body. In a preferred embodiment, the dental hand instrument is provided with an improved and simplified drive means whereby the number of working parts required to drive a dental work piece secured thereto is significantly reduced.

3,727,313

DENTAL PROPHYLAXIS RIGHT ANGLE HAND PIECE

Raymond C. Graham, Mountain View, Calif., assignor to The Denticator Co., Inc., San Francisco, Calif.

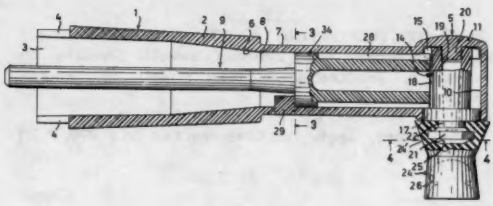
Filed Sept. 22, 1971, Ser. No. 182,672

Int. Cl. A61c *1/10*

U.S. Cl. 32—27 10 Claims

A disposable dental hand piece having a one-piece elongated tubular shank provided with a right angle hollow head at one end integral therewith, which head is formed with an opening directed at a right angle to the shank for insertion of a gear into the head which gear has a dental tool holder integral therewith, the tool holder projecting outwardly of the opening when the gear is within the head. An elongated spindle extends through the tubular shank from the end opposite the

head and has radially projecting axially extending ribs on the outer end portion adjacent to said gear the terminal outer end of the spindle holding the gear and tool holder against withdrawal from the head with the terminal end portions of



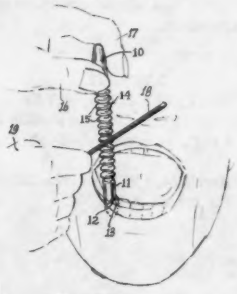
the ribs providing teeth in mesh with the teeth of the gear for driving the latter. A latch integral with the shank is movable to a non-returnable position holding the spindle against retraction out of the shank where the teeth on the spindle and on the gear are in driving relation.

3,727,314

DENTAL TOOL

Robert Marion De Angeles, 818 Broadway, Melrose Park, Ill., and Dennis Zbylut, 5141 North East River Road, Chicago, Ill.

Filed Dec. 27, 1971, Ser. No. 211,951
Int. Cl. A61c *3/00*
U.S. Cl. 32—41 **6 Claims**



A crown-setting tool having one end notched or concave to conform generally to the configuration of a crown which is being cemented on a tooth, to firmly hold the crown while a vibratory rod is rubbed across the face of corrugations provided in the tool, with the resulting vibrations created through the rubbing action effective to set the crown and force out excess cement without undue distress to the patient or adverse effects upon the crown or the tooth.

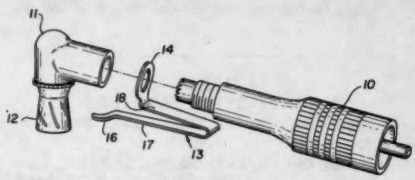
3,727,315

DENTAL PROPHYLAXIS APPARATUS

Ronald P. Spinello, 372 Post Avenue, Westbury, N.Y.

Filed Nov. 8, 1971, Ser. No. 196,364The portion of the term of this patent subsequent to Nov. 23, 1988, has been disclaimed.
Int. Cl. A61c *3/06*
U.S. Cl. 32—59 **9 Claims**

A dental prophylaxis device including a rotary pliable cup-shaped tooth-engaging member formed with paste-impelling patterns on its outside walls which urge the paste toward the tooth under the effects of rotation, and a resilient wiper finger attached to the handpiece which drives the pliable cup adapted to wipe against the side wall of the cup above the tooth surface and capable of yielding with distortion of the cup under pressure against the tooth, thus preventing migra-



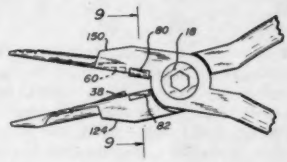
tion of paste backward toward the driving mechanism and further precluding buildup of paste and saliva on the outside walls preventing splattering.

3,727,316

PLIER-TYPE TOOL FOR ORTHODONTISTS

Louis Goldberg, 68 Lincoln Terrace, Harrington Park, N.J.

Filed April 24, 1972, Ser. No. 246,931
Int. Cl. A61c *7/00*
U.S. Cl. 32—66 **8 Claims**



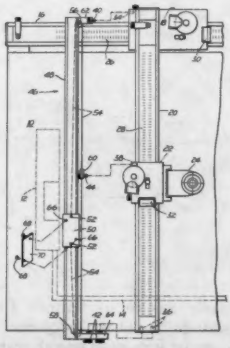
An orthodontic plier-type tool is disclosed in which jaws are formed to bend a wire into the desired open or closed loop sizes as determined for the particular arch wire to be used in the mouth of the patient. The jaws of this plier include a mating conically shaped male and female wire bending or straightening means. In one embodiment is shown wire cutting means carried by the jaws, thus requiring only one tool to be used to cut and form an arch wire as used by the orthodontist in his task of straightening children's teeth.

3,727,317

DRAFTING APPARATUS

Kurt Gornowitz, Lahr, Black Forest, Germany, assignor to Albert Nestler GmbH, Lahr/Schwarzwalb, Germany

Filed June 9, 1971, Ser. No. 151,426
Claims priority, application Germany, June 11, 1970, G 70 21 861.0
Int. Cl. B43l *13/02*
U.S. Cl. 33—76 R **2 Claims**



A device for attachment to a drafting board which is movable between horizontal and upright positions. The device in-

cludes an X-bar and a Y-bar carrying respective carriages to facilitate plotting points on the board with reference to a zero co-ordinate. When the board is tilted a removable balance weight is added to compensate for the weight of the moving parts.

3,727,318

MICROMETER APPARATUS

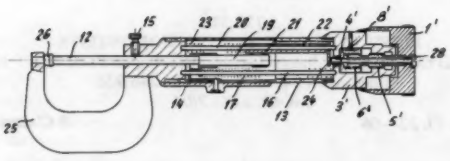
Johann Meier, Casa Clarissa CH - 6645 Brione Sopra, Minusio, Switzerland

Filed Oct. 26, 1970, Ser. No. 83,841

Claims priority, application Switzerland, Oct. 27, 1969, 160 78/69

Int. Cl. G01b 5/00

U.S. Cl. 33—170 **4 Claims**



Micrometer apparatus for accurately measuring and indicating distance, including a vernier casing rotatably mounted concentrically about a cylindrical micrometer head, a follower member arranged for coaxial reciprocatory movement relative to said micrometer head, and actuator means connected with said vernier casing for effecting longitudinal displacement of said follower member relative to said micrometer body. The invention is characterized in that the actuator means includes first and second screw thread means of different pitch and thread direction for connecting the vernier casing with the micrometer body and with the follower, respectively.

In accordance with a modification of the invention, the micrometer head is connected with a housing that supports a gauge pin mounted for axial sliding movement in a direction parallel with the actuator axis, a scale plate being carried by said gauge pin. The follower member is operable to displace a reader marker relative to said scale plate to afford a vernier reading of the position of the qauge pin relative to the housing.

3,727,319

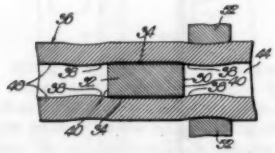
VENTILATED SIGHT RIB MOUNT ON A SHOTGUN BARREL

George R. Snyder, Woodbridge, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.

Filed April 5, 1971, Ser. No. 130,887

Int. Cl. F41g 1/42, 1/00; F41c 21/00

U.S. Cl. 33—233 **2 Claims**



A metal sight rib has in its bottom a dovetail groove received with a slide fit on dovetail projections on spaced and aligned upright posts on a shotgun barrel, with the groove having wedge formations bearing against the opposite ends of the dovetail projections on selected posts for locking the sight rib to the latter, and a method of thus mounting the sight rib, involving sliding the same into fit with the dovetail projections on the posts, and crimping the sight rib inwardly at the opposite ends of the dovetail projections on selected posts for wedging the sight rib to the ends of these projections.

3,727,320

APPARATUS FOR DRYING LENGTHS OF DYED FABRICS

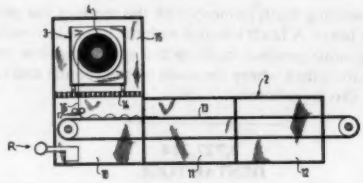
Manfred Schulerer, 6122 Erbach/Odenwald, Germany, assignor to Bruckner-Apparatebau GmbH, Werner-Von Siemens-Strasse, Germany

Filed Oct. 18, 1971, Ser. No. 189,979

Claims priority, application Germany, Oct. 21, 1970, P 20 51 635.2

Int. Cl. F26b 19/00

U.S. Cl. 34—70 **6 Claims**



Apparatus for drying lengths of dyed fabrics wound on a beam comprises a carriage for supporting the beam in a dryer housing having a drying chamber located beneath the housing and into which the fabric is unwound. Within the chamber and in a position to receive the descending fabric is a conveyor which carries the fabric in a spread condition through successive other drying chambers.

3,727,321

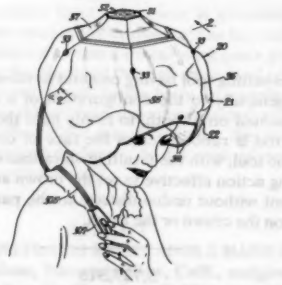
PORTABLE HAIR DRYER

Robert S. Waters, Oak Brook, Ill., and Ronald R. Liedtke, Redondo Beach, Calif., assignors to Sunbeam Corporation, Chicago, Ill.

Filed March 24, 1971, Ser. No. 127,666

Int. Cl. A45d 20/24

U.S. Cl. 34—99 **18 Claims**



An appliance for drying hair including a flexible hat or bonnet which provides a manifold for circulating air which is heated and propelled by means of a motor driven fan supported in the center of the crown portion of the hat. The motor driven blower being mounted with a portion thereof positioned within the hat and a portion extending outwardly therefrom. The blower unit being secured to the flexible hat by means of a semiflexible frame, heat sealed to the cap and adapted to be snapped into engagement with the peripheral portions of the motor driven blower housing.

3,727,322

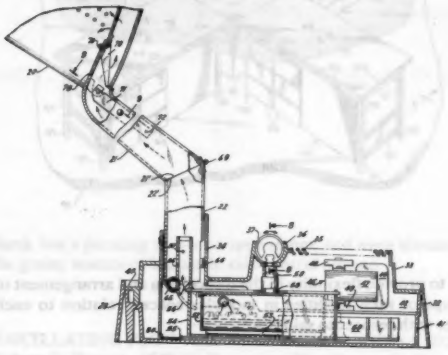
HAIR SETTING-DRYING DEVICE

Henry J. Walter, Wilton, Conn.; Edward J. Doyle, Hatboro, and Robert R. Ream, Ephrata, both of Pa., assignors to Schick Incorporated, Lancaster, Pa.

Continuation of Ser. No. 649,209, June 27, 1967, abandoned. This application Oct. 2, 1970, Ser. No. 77,604

Int. Cl. A45d *20/00*

U.S. Cl. 34—99 19 Claims



A hair drying device in which provision is made for the generation and injection of steam into the duct system during a predetermined portion of the cycle of operation.

3,727,323

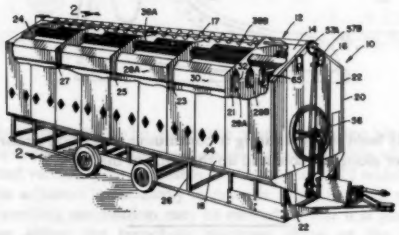
COUNTERFLOW PREHEATING MEANS FOR A CONCURRENT COUNTERCURRENT GRAIN DRYER

Elmo R. Meiners, Anchor, and John O. Bradford, Gibson City, both of Ill., assignors to said Meiners, by said Bradford

Filed April 12, 1971, Ser. No. 133,253

Int. Cl. F26b *17/12*

U.S. Cl. 34—170 5 Claims



A concurrent-countercurrent flow column grain dryer of the type having an enclosed bin with a wet grain inlet at the top and a dry grain outlet at the bottom includes means for introducing hot air as a drying medium for the grain in a flow concurrent with the grain. Means are also provided at the bottom of the bin to introduce cool air which flows countercurrent to the grain flow. A first exhaust is provided intermediate the points where hot and cool air are introduced. A second exhaust positioned above the hot fluid inlet ducts also exhausts hot air flowing upwardly from the hot fluid inlet ducts in a countercurrent direction to the downward flowing grain and preheats the wet grain immediately after the wet grain enters the enclosed bin.

3,727,324

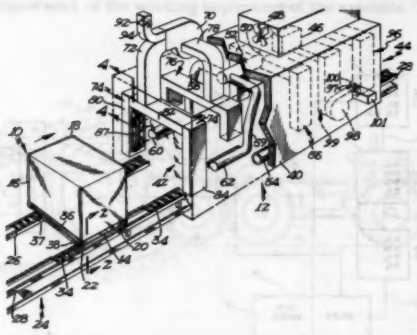
SHRINK TUNNEL FOR PALLETIZED LOADS

Hans L. Melgaard, Mound, Minn., assignor to Despatch Industries, Inc., Minneapolis, Minn.

Filed Sept. 18, 1970, Ser. No. 73,393

Int. Cl. F26b *19/00*

U.S. Cl. 34—216 9 Claims



A shrink tunnel for shrinking a covering of plastic material onto a palletized load including apparatus for generating a curtain of air at entrance and exit of the tunnel to isolate a shrink zone within the tunnel from an ambient environment and to provide preheating and cooling of the plastic cover at entrance and exit, respectively, as the load moves through the tunnel. The shrink zone has a pair of stationary nozzles near the entrance of the tunnel for directing heated air at the skirt of the plastic covering adjacent the base of the palletized load to shrink the skirt to the pallet. The remainder of the covering is thereafter shrunk onto the load thereby protecting the load from the elements during shipment or storage and binding it to the pallet for convenient shipment.

3,727,325

PROCESS AND APPARATUS FOR THE TREATMENT OF TEXTILES MATERIALS

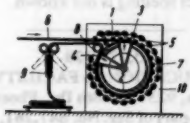
Heinz Fleissner, Egelsbach; Erich Feess, Lorsbach, and Wilhelm Gahlert, Hofheim, all of Germany, assignors to Vepa AG, Basel, Switzerland and Farbwerke Hoechst Aktiengesellschaft normals Meister Lucius of Bruning, Frankfurt/Main, Germany

Filed Feb. 3, 1969, Ser. No. 795,993

Claims priority, application Germany, Feb. 3, 1968, P 17 10 509.8

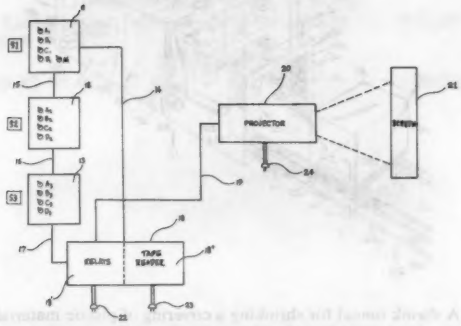
Int. Cl. F26b *11/02*

U.S. Cl. 34—115 21 Claims



The present disclosure is directed to a process and apparatus for the heat-treatment of textile materials, particularly those materials which are only slightly or not permeable to air when in a wet condition. More particularly, the present disclosure is directed to a process and apparatus for producing a steam cushion at the surface of the material being treated, said material being conveyed on the surface of sieve drum means.

3,727,326
PROGRAMMED LEARNING DEVICE
James D. J. Holmes, Dogwood Lane, Laurinburg, N.C.
Filed July 24, 1970, Ser. No. 58,096
Int. Cl. G09b 7/08
U.S. Cl. 35—9 A 10 Claims



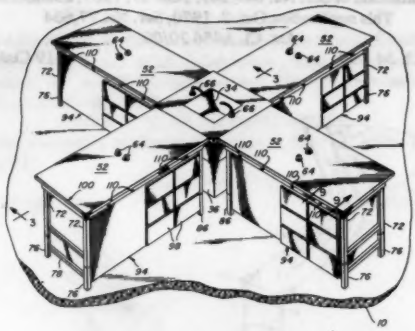
In abstract, a preferred embodiment of this invention is a programmed learning device wherein one or more students, small groups working together, are taught by the non-linear method of programmed learning. Specifically, after the text material is reviewed by the group, a question relative thereto is presented. Feedback relative to wrong answers will then be first displayed prior to the giving of feedback relative to the correct answer. No unchosen wrong answer feedback, however, is displayed.

3,727,327
CODED FILING AND RETRIEVAL SYSTEM
Thomas C. Ekeland, 45 John Street, Brooklyn, N.Y.
Continuation-in-part of Ser. No. 65,310, Aug. 19, 1970, abandoned. This application June 19, 1972, Ser. No. 264,294
Int. Cl. G09b 19/00
U.S. Cl. 35—24 R 3 Claims

A filing and retrieval system whereby alphabetic name and titles are interpreted by numeric code. This can be done by following a set of rules manually. The encoding of words including names is characterized in the dividing of the word into phonic sounds, irrespective of the actual spelling of the word, and the assignment of a numeric code to each phonic sound excepting the first sound, followed by the filing of items bearing the numeric code in serial order, without regard to the spelling of the word, thereby permitting the retrieval of a filed item even if the exact spelling is not known.

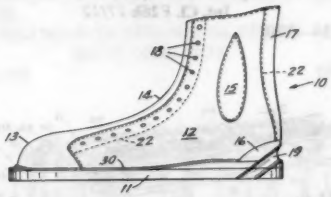
3,727,328
EDUCATIONAL FACILITY
Rafael L. Valenzuela, 9237 N. 18th Dr., Phoenix, Ariz.
Continuation-in-part of Ser. No. 847,261, Aug. 4, 1969, abandoned. This application Nov. 8, 1971, Ser. No. 196,488
Int. Cl. A47k 3/16
U.S. Cl. 35—60 9 Claims

An educational facility for the teaching of subjects, such as science, including chemistry, biology, and other related subjects, said facility comprising a floor having recessed plumbing facilities spaced apart or in modular arrangement, and wherein teachiing sinks are disposed over the recesses and each serving a plurality of radiating tables; the tables and sink being provided with vertically variable supports, and quick disconnect coupling means in said recesses for connecting various fluid supply means, a sink drain, and electrical equipment so as to accommodate the teaching of various subjects



and to provide flexibility in the disposition and arrangement of groups of such facilities in modular spaced relation to each other with respect to said floor area.

3,727,329
SKI BOOT
Roy L. Peterson, 73 Wildwood Road, Mahtomedi, Minn.
Filed Aug. 23, 1971, Ser. No. 174,059
Int. Cl. A43b 00/00
U.S. Cl. 36—2.5 AL 2 Claims



A ski boot incorporating a continuous metallic reinforcing member along the sole and up the back of the boot.

3,727,330
MULTI-COLOR SHOE SOLE BLANKS
Walter Hoche, Weinheim, Bergstrahe, Germany, assignor to Carl Freudenberg, Weinheim, Germany
Filed April 9, 1971, Ser. No. 132,848
Claims priority, application Germany, May 27, 1970, G 70 19 747.6
Int. Cl. A43b 13/06
U.S. Cl. 36—32 R 6 Claims

A shoe sole blank of synthetic material is produced by applying a brown color layer to a sheet of synthetic material, applying another coat of black color layer over the brown, the black being of limited abrasion-resistance, stamping shoe sole blanks out of the sheet, and selectively abrading away the black layer from the central portion of the blank correspond-

ing to the ball of the foot. Skeletal traces of the black color layer may remain even in said central portion. The resulting

blank has a pleasing two-tone appearance and even simulates the grainy texture of leather in said central portion.

3,727,331

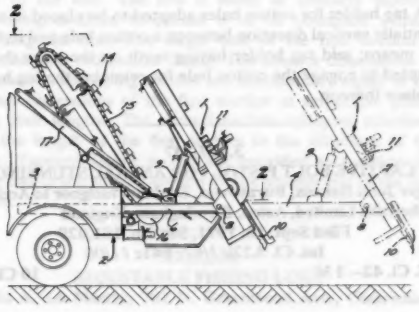
OSCILLATING PLOW AND TRENCHER COMBINATION

Robert O. Hansen, 4549 W. Rosecrans, Hawthorne, Calif.

Filed Oct. 20, 1971, Ser. No. 190,974

Int. Cl. E02f *5/06, 5/18*

U.S. Cl. 37—86 **6 Claims**



When a trench is to be dig for the purpose of laying pipe, cable, or tubing, the cutting mechanism includes a blade which is vibrated vertically by a suitable driving means, and which can also be adjusted horizontally to provide space through which the trenching mechanism may be moved so that it is possible to use either the trenching machine alone or the plow mechanism alone, or the use of both mechanisms simultaneously if required.

3,727,332

LASER GUIDANCE SYSTEM FOR GRADE CONTROL

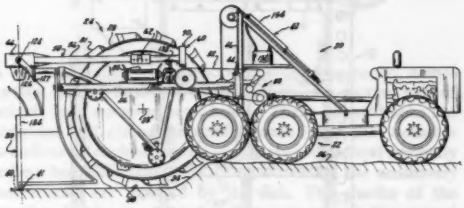
Walter George A. Zimmer, 11 Jeffrey St., Chatham, Ontario, Canada

Filed Nov. 22, 1971, Ser. No. 200,893

Int. Cl. E02f *5/08*

U.S. Cl. 37—97 **28 Claims**

A vehicular machine, such as a trencher, having working means, such as a digging wheel, carried thereon for working material to a desired grade as the machine moves along a given path. Vertical adjustment of the working means is automatically controlled by a laser guidance system mounted on the machine for movement therewith. The guidance apparatus includes a reference means, such as a shoe of a trencher, movable with the machine and which engages the surface of the material already worked to the desired grade by the machine. The guidance apparatus also includes a detector apparatus comprising a laser beam generator mounted on a stabilizing platform and a beam sensor remote therefrom but enclosed within the same housing, the housing being carried by the framwwork of the working implement of the machine. The



stabilized laser is preferably located in close proximity to the reference means with the beam aimed generally in the plane of motion of the working implement relative to the machine. Deviations of the working means from the desired grade are sensed by relative motion between the beam and sensor to develop a control signal utilized by a hydraulically actuated hoisting mechanism to raise or lower the working means to thus correct for such deviations and thereby maintain the material being worked at the desired grade as the machine moves along said path.

3,727,333

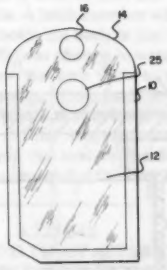
DATA PROCESSING CARD RETAINER

Samuel W. Ward, 91 North Malcolm St., Ossining, N.Y., and Richard J. Hilosky, Tappan Hills Apts., Briarcliff Manor, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,171

Int. Cl. G09f *3/18*

U.S. Cl. 40—10 R **2 Claims**



A retaining pouch or holder for a data processing card or computer information or control card which is constructed to provide peripheral protection for the card against creasing, tearing and other mutilation, a safe storage for the card which is lockable to prevent accidental loss, a means of attachment to the article particularly referred to in the information on the card and convenient access to the card for extracting the card from the holder.

3,727,334

FILING FRAME OF FILM MOUNTS

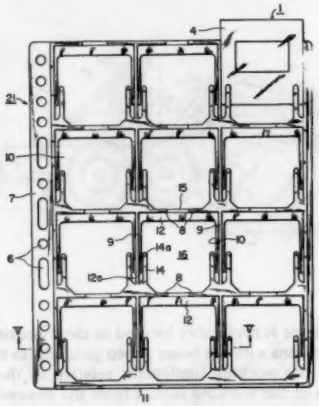
Yoshichika Sakamoto, No. 15, 2-chome, Senkawa-cho, Toshima-ku, Tokyo, Japan

Filed Nov. 13, 1970, Ser. No. 89,162

Claims priority, application Japan, Nov. 17, 1969, 44/108285; Dec. 26, 1969, 44/123204

Int. Cl. G09z *23/10*

U.S. Cl. 40—104.18 **3 Claims**



A filing frame for holding a plurality of film mounts in a lattice disposition while allowing inspection and projection of the films as held by the frame. Each film storing space of the filing frame has a pair of notches formed at lower ends of its seating ledges, so as to allow the film mount to swing about the border edge between the notch and a non-notched portion of the seating ledge.

3,727,335

QUICK-CLAMPING PASSE PARTOUT

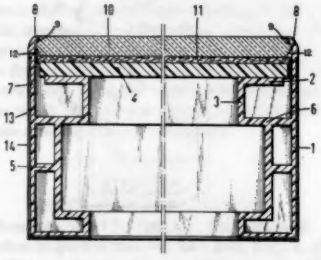
Gunter Karl Rudolf Rochelt, Schulinstrasse 7, Ulm, Germany

Filed Dec. 28, 1970, Ser. No. 101,828

Claims priority, application Germany, June 8, 1970, P 20 28 107.6

Int. Cl. G09f *1/12*

U.S. Cl. 40—156 **10 Claims**



A glass plate is adapted to be clamped against the front side of a rear wall. Strip members embrace the edge of the glass plate and hold it in engagement against the rear wall and consist of spring legs, which are connected at least on two opposite sides to the rear wall by a spring bight and are provided at their free forward ends with detent projections, which yield to rearward pressure applied by the glass plate until the latter snaps into position behind said projections. The detent projection consists of an end portion of the spring leg. This end portion is angled toward the interior of the passe partout and in resilient engagement with the beveled forward surface of the glass plate, which is beveled at its ends on both sides like a roof, so that the end portion of the spring leg holds the glass plate in position and the or forward end of the spring leg is substantially flush with the top or forward surface of the glass plate.

3,727,336

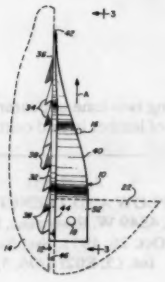
COTTON BALE TAG HOLDER

Joseph L. Mitchell, 234 North Fraser Drive, Mesa, Ariz.

Filed May 5, 1971, Ser. No. 140,387

Int. Cl. G09f *3/08*

U.S. Cl. 40—305 **1 Claim**



A tag holder for cotton bales adapted to be placed in a substantially vertical direction between a cotton bale and its binding means; said tag holder having teeth on the sides thereof adapted to engage the cotton bale for retaining the tag holder in place thereon.

3,727,337

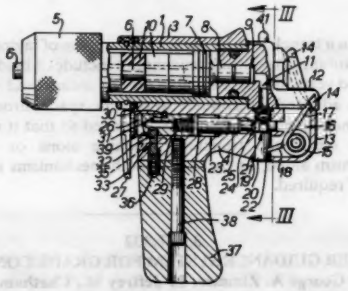
CAPTIVE BOLT PISTOL FOR ANIMAL STUNNING

Roger John Hancox, Burntwood, England, assignor to Accles & Shelvoke Limited, Aston, Birmingham, England

Filed Sept. 16, 1971, Ser. No. 181,029

Int. Cl. A22b *3/02*; F41c *11/00*

U.S. Cl. 42—1 M **10 Claims**



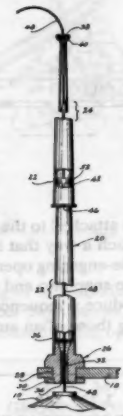
In a captive bolt pistol, the barrel and the breech block are incorporated in a unit which is rotatable about the barrel axis between a firing position and a spent cartridge extracting position, and the unit is provided with a cam adapted to cock the firing mechanism of the pistol as the unit is tapered from the former to the latter of the said positions.

3,727,338

TUBULAR CASTING ROD HAVING AN AXIALLY-ENCLOSED LINE

Donald K. Pedersen, 924 Hoyes Avenue, Racine, Wis.

Filed Sept. 7, 1971, Ser. No. 178,040
Int. Cl. A01k *87/00*
U.S. Cl. 43—18 R 3 Claims



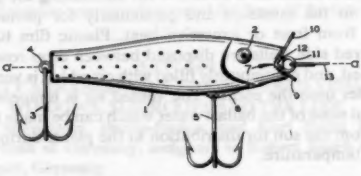
A casting rod for use in fishing, comprising a tubular rod. The fishing line is entirely enclosed within the bore of the rod and passes from a casting reel axially through the rod and the eyelet at the tip, thus avoiding tangling, snagging and other injuries to the line. The rod is made in similarly tapered, telescoping sections to permit it to be collapsed without disturbing the line. The larger end of the first section is mounted on a rod handle frame. The interior dimensions of the second telescoping section are substantially equal to the exterior dimensions of the first section at respective points along their lengths. The second section collapses exteriorly over the length of the first section in the direction of the frame. Tapered sleeve means are provided to position the larger end of the second section on the smaller end of the first section.

3,727,339

ADJUSTABLE FISHING LURE

Harold A. Le Master, 701 N. Greenwood Ave., Clearwater, Fla.

Filed June 9, 1971, Ser. No. 151,315
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.22 1 Claim



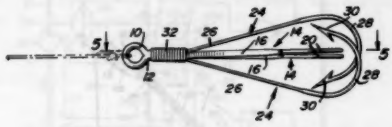
An adjustable fishing lure of the floater type, of small fish appearance, having an activating member attached thereto comprising two arcuate shaped planar deflecting vanes of different size joined in a common junction with a predetermined angle therebetween. The vanes are transversely positioned in a V-shaped mouth of the lure facing forward with the larger vane uppermost and the smaller vane lowermost for activating the lure on and near the surface of the water when motivated by a line. The inversion of the vane will cause the lure to produce wobbly swimming motion underwater when motivated.

3,727,340

SNAGLESS FISHING HOOK

Raymond Harris, 1030 Fourth Street, Saraland, Ala.

Filed May 18, 1970, Ser. No. 38,079
Int. Cl. A01k *83/00*
U.S. Cl. 43—43.2 1 Claim



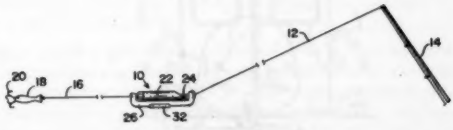
A snagless fishhook construction having four hooks, namely, a first pair of duplicate short hooks and a second pair of relatively long complemental hooks. These paired hooks are equidistant and circumferentially spaced and the yieldable free ends cross each other, are yieldingly cocked and normally weedless but are adapted to spring out when the sensitively pliant shanks are grasped by the fish. The shanks of the respective hooks are thin and flat and are readily moved toward each other when squeezed, whereupon the barbed hooks (one pair or both pairs) spring out and snare the fish.

3,727,341

DEPTH CONTROL DEVICE

Norman H. Nye, 1348 Highbridge Road, Cuyahoga Falls, Ohio

Filed Jan. 18, 1972, Ser. No. 218,713
Int. Cl. A01k *85/00*
U.S. Cl. 43—43.13 14 Claims



A device which is attached to a fishing line to bring the lure to the desired temperature level. The device has an elongated body with a slanted front end and angled fins at the rear end. The body is mounted to a keel so that the body can rotate about its longitudinal axis. A latch member which is controlled by a bimetallic element holds the body in non-rotating relation with the keel until a sufficient change in water temperature is encountered. At this time the latch shifts to its opposite position permitting 180° rotation of the body so that the slanted forward end thereof will cause the device to move upwardly or downwardly toward the desired temperature zone. A line connects the forward end of the keel to the fishing rod and a second line connects the rear end of the keel to the lure.

3,727,342

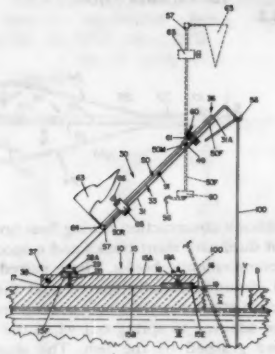
ICE FISHING TIP-UP APPARATUS

John L. Lindsey, Jr., 1804 Evans Street, Omaha, Nebr.

Filed June 30, 1971, Ser. No. 158,275
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 4 Claims

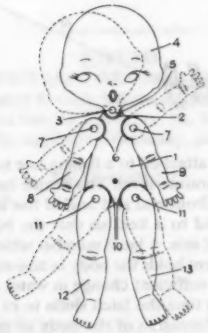
An ice fishing tip-up apparatus wherein a fishing line is suspendable from a forward position of an elongate pivotal lever, the lever at its fulcrum medial portion being pivotably attached at a fixed location to an upright member. The lever forward-arm is provided with a loosely surrounded slidable weight having a rearward limit of travel at which the lever is caused to assume a first-stable or "ready" condition, the slidable weight being forwardly incrementally urged along the lever forward-arm during downward tugs on the fishing line

whereupon the lever is thereby caused to assume a second-stable or "tipped" condition, which can be readily returned by the operator to the first-stable condition. The apparatus can



be made to be of variable sensitivity and can be structurally made to an exceedingly compact form for interim storage purposes.

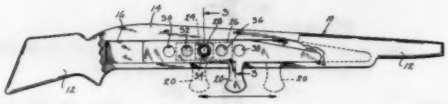
3,727,343
JOINTED FIGURE TOY
Gervasio Chiari, Antonelli 2, Cologne (Brescia), Italy
Filed Dec. 8, 1971, Ser. No. 206,029
Claims priority, application Italy, Sept. 1, 1971, 5196-A/71
Int. Cl. A63h *3/10*
U.S. Cl. 46—161 **3 Claims**



The toy of the invention, preferably representing a doll, is substantially flat-surfaced and has a centrally positioned member body to which are pivotably connected a plurality of members such as head and limbs. The head and limbs are capable of being detached from the body, of assuming different positions upon rotating about the pivoting means which secure them to the body, and of being foldably superimposable upon the body for easy and compact storage. On the upper portion of the body there is suitably provided behind the head a ring with corresponding string.

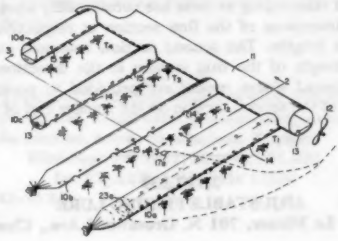
3,727,344
TOY GUN
Ernest F. Dill, 866 N. 14th St., Manitowoc, Wis.
Filed Aug. 25, 1971, Ser. No. 174,879
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 **6 Claims**

An elongated slot is formed in the interior of a toy gun body and a relatively flat slide is movable within the slot. A recess is formed in one side of the slot, with yielding means such as an elastic band over the recess, and a marble positioned on top of the elastic band over the recess. A row of marble-engaging openings is formed in the flat slide, with each of the openings being smaller in diameter than the marble but large enough in diameter to permit a portion of the marble to project through



the flat slide. A handle is attached to the flat slide and projects outside of the body in such a way that it can be grasped and pulled to move the marble-engaging openings over the marble. This causes the marble to snap into and out of the marble-engaging openings and produce a sequence of explosive sounds and vibrations simulating those of an automatic rifle or other weapon.

3,727,345
METHOD OF PROTECTING PLANTS AND STIMULATING THEIR GROWTH
Norman J. Smith, 33 Chestnut Drive, Apt. 113, Vineland, N.J.
Filed Oct. 28, 1970, Ser. No. 84,645
Int. Cl. A01g *13/06, 13/02*
U.S. Cl. 47—2 **9 Claims**

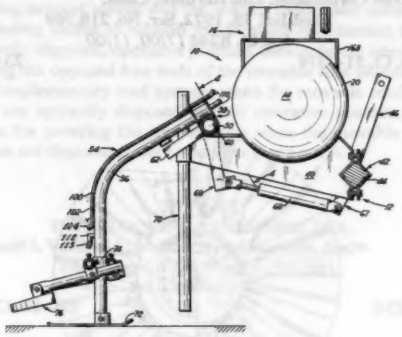


There is disclosed a structure for stimulating the growth of plants in the outdoors and particularly for protecting the plants from frost or excessive heat. Plastic film tubes with apertured side walls are disposed between crop rows, water-ballasted, and continuously filled with air which is vented from the sides onto the plants. The vented air is tempered by the thermal mass of the ballast water which can be made to absorb heat from the sun for distribution to the plants during periods of low temperature.

3,727,346
OIL-FIRED FLAME CULTIVATOR
W. Edward Kramer, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Oct. 1, 1970, Ser. No. 77,123
Int. Cl. A01m *15/00*
U.S. Cl. 47—1.44 **7 Claims**

A flame cultivator for row crops as opposed to field crops. The improvements of the invention comprise modification of commercial flame weeding equipment so as to render the structural burner supporting legs into air sumps, to thereby

eliminate the need for surge tanks, large manifolds, and the like. A second improvement is a modified burner housing to



facilitate the drawing in of secondary air and to protect the nozzles and electrodes from stones, tall weeds and the like which may be encountered during operation.

3,727,347

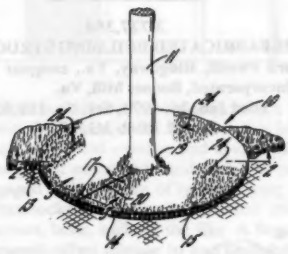
GROUND COVER

Richard D. Barnes, Loves Park, Ill., assignor to Southern Imperial, Inc., Tupelo, Miss.

Filed Sept. 7, 1971, Ser. No. 178,300

Int. Cl. A01g *9/00, 1/08*

U.S. Cl. 47—32 **1 Claim**



An artificial grass-like covering for the ground around a tree includes a grass-like mat with ends held together in abutting edge-to-edge engagement by a staple which also serves to anchor the mat to the ground thus forming an unbroken ring of artificial grass completely around the base of the tree.

3,727,348

SAFETY ARRANGEMENT FOR POWERED VEHICLE WINDOWS, SUN-ROOFS AND THE LIKE

Helmut Steinmann, Baden-Baden, and Karl Heinz Burger, Buhl, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

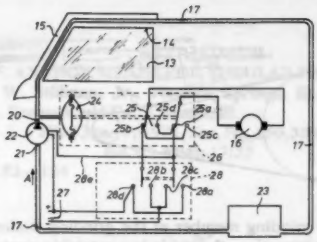
Filed April 10, 1972, Ser. No. 242,486

Claims priority, application Germany, June 2, 1971, P 21 27 207.1

Int. Cl. E05g *11/38*

U.S. Cl. 49—28 **16 Claims**

In a vehicle, a safety arrangement for powered windows, sun-roofs, and the like. A squeezable fluid conduit at least in part bounds an opening. A window or the like is movable by a motor in a direction closing the opening. A pump is connected with the fluid conduit and establishes a flow of fluid therethrough. The pump produces a pressure change in the conduit when the conduit is squeezed. A pressure-responsive control arrangement controls operation of the motor as a function of pressure changes in the conduit resulting from



squeezing of the conduit due to the presence of an object caught between the conduit and the window when the latter is moving in closing direction.

3,727,349

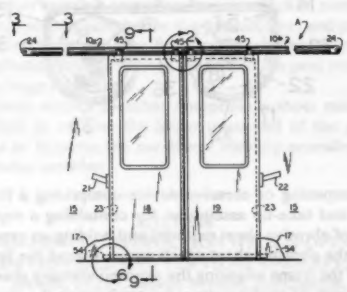
SUSPENSION MECHANISM FOR SLIDING DOORS

Cecil Bainbridge, La Mesa, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sept. 21, 1970, Ser. No. 74,045

Int. Cl. E05d *13/02*

U.S. Cl. 49—411 **11 Claims**



A sliding door for a rapid transit type railway car is suspended from a track anchored only at its ends to the car body above a door opening. The track has a ridged base portion with a round bar seated in a groove in the apex of the ridge and secured to the base. A pair of sliding doors, each of a size to cover half the door opening, are each suspended from one of the tracks by a pair of open type, linear motion ball bearing hangers which are mounted one at each end of the top of each door and ride along the bar portion of their respective tracks. The bottoms of the doors clear the lower end of the door opening, and a downwardly open channel provided in the lower edge of each door receives roller guides mounted on the sill structure to firmly guide the door and restrain it against inward and outward displacement by lateral forces acting on the doors.

3,727,350

CONTOUR GRINDER

Robert L. Schaller, Camillus, N.Y., assignor to Sundstrand-Engelberg, Inc.

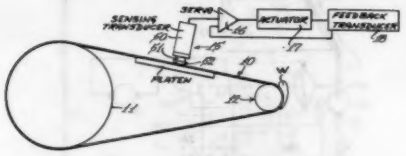
Filed Nov. 16, 1971, Ser. No. 199,257

Int. Cl. B24b *2/12*

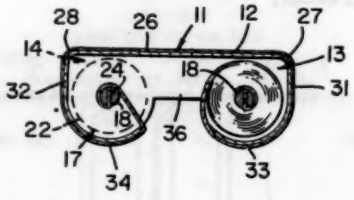
U.S. Cl. 51—141 **17 Claims**

A contour grinding apparatus including an endless belt grinding member trained about a drive roller and an expansible cylindrical guide, the latter of which directs the grinding member past a work station, together with a device for sensing the thickness of the grinding member to detect wear, and a

device responsive to the sensing device for expanding the guide to compensate for wear of the grinding member and thereby maintain a constant radius of the work contacting surface of the grinding member at the grinding station. In one form of the invention, the guide is a rotatable contact roller, and in another form the guide is a stationary cylindrical platen.

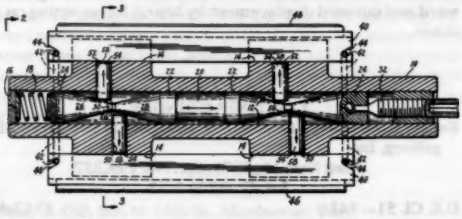


3,727,351
KNIFE SHARPENER
Austin L. Hughes, 193 Charter Oak, San Francisco, Calif.
Filed May 19, 1971, Ser. No. 144,923
Int. Cl. B24d *17/00*
U.S. Cl. 51—361 **6 Claims**



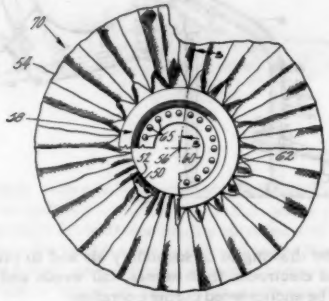
A sharpening or abrasive device comprising a frame with supply and take-up assemblies for containing a replacement supply of abrasive sheet material and holding an exposed portion of the abrasive sheet which wraps around the frame, portions of the frame engaging the exposed abrasive sheet providing a variety of configurations for conforming the abrasive surface with different cutting edges or surfaces to be sharpened or abraded and for providing an abrasive surface on which the device rests.

3,727,352
HONING HEAD
Carlos Alberto Palazzi, Rua Luiz 1,400, Campinas, Brazil
Filed May 17, 1971, Ser. No. 143,750
Int. Cl. B24b *9/02*
U.S. Cl. 51—338 **3 Claims**



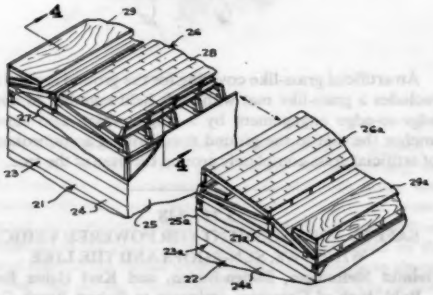
A multi-tapered piston mounted in a push-pull arrangement for actuating a plurality of multi-finished hones.

3,727,353
BUFFING WHEEL AND METHOD OF MAKING SAME
Robert C. Pixley, Huntington, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 18, 1972, Ser. No. 218,769
Int. Cl. B24d *17/00, 11/00*
U.S. Cl. 51—376 **23 Claims**



A buffing wheel is made from abrasive sheet material by folding at least one sheet of the abrasive sheet material over a retaining wire, then corrugating the retaining wire and the abrasive sheet at the fold so as to impart corrugations to the abrasive sheet material, then forming the corrugated sheet material and retaining wire into circular form and retaining the circular form abrasive sheet material for rotation concentrically about an axis with the corrugated retaining wire being retained between the faces of a central split disc.

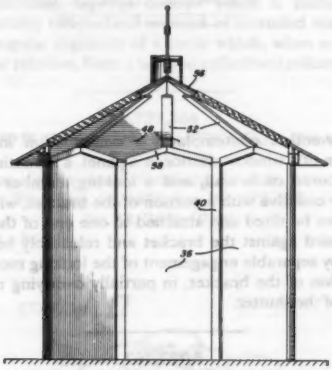
3,727,354
PREFABRICATED BUILDING STRUCTURE
John Dillard Powell, Ridgeway, Va., assignor to Continental Homes Incorporated, Boones Mill, Va.
Filed Jan. 26, 1971, Ser. No. 109,835
Int. Cl. E04b *1/32, 7/16*
U.S. Cl. 52—71 **52 Claims**



A prefabricated building structure generally consisting of at least two modular units having complementary roof systems secured together to provide an integral building structure, each of the complementary roof systems including a longitudinally disposed stationary roof section and a longitudinally disposed movable roof section hingedly connected along a longitudinal axis to the stationary roof section, the stationary roof section having upwardly projecting seating means, the movable roof section having rigidly connected, depending support means and an extension leg hingedly connected to the depending support means whereby the extension leg may be moved away from the seating means and the depending sup-

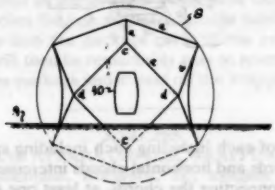
port means may be seated on the seating means to support the movable roof section in a downwardly disposed, inoperative position, and the extension leg may be moved between the depending support means and the seating means and seated on the seating means to support the movable roof section in an upwardly disposed, operative position, means rigidly interconnecting the opposed free ends of the movable roof sections of the complementary roof systems when the movable roof sections are upwardly disposed in their operative position, and means for covering the roof systems when the movable roof section are disposed in their operative positions.

3,727,355
INTERLOCKING PANEL SHELTER
Reginald I. Vachon, 116 Miller Street, Auburn, Ala.
Filed Jan. 4, 1971, Ser. No. 103,651
Int. Cl. E04b *7/00*
U.S. Cl. 52—82 **4 Claims**



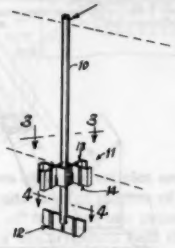
A wall unit and a roof unit each comprising a plurality of edge interconnected panels joined by removable joining strips or hinges. Each roof panel overlies and is engaged with portions of two subjacent wall panels, and each wall panel underlies and is engaged with portions of two overlying roof panels whereby an interlocked structure is provided utilizing, if so desired, no screws, bolts, nails or the like. A floor unit comprising floor panels offset relative to and underlying the wall panels can also be provided.

3,727,356
PREFABRICATED STRUCTURES
Ernest Uri Appenzeller, 15 Maharal St., Tel Aviv, Israel
Filed Sept. 17, 1968, Ser. No. 760,188
Int. Cl. E04b *1/32*
U.S. Cl. 52—81 **2 Claims**



A prefabricated structure constituting at least the major portion of a body formed of 12 hyperbolic paraboloidal panels respectively secured together at their edges, each panel having four equal edges enclosing substantial right angles and having a diagonal whose length is substantially equal to four-thirds the length of the panel edge, the ratio of the elevation of the panel to the edge length thereof being substantially equal to 0.44.

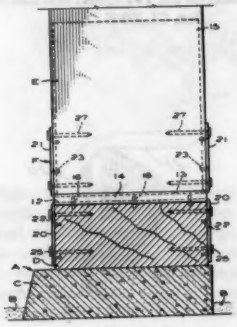
3,727,357
ANCHOR MEANS FOR TUBULAR POST
Harold W. Stillman, Jr., Western Springs, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed June 7, 1971, Ser. No. 150,359
Int. Cl. E04h *17/22*
U.S. Cl. 52—154 **8 Claims**



Anchor means for tubular posts intended to be driven into the ground comprising upper and lower anchor members. The upper anchor member comprises two interlocked components which embrace the post below the ground level and prevent it from tipping or leaning by functioning as a cantilever plate and distributing lateral stresses applied to the post over a substantially large earth area.

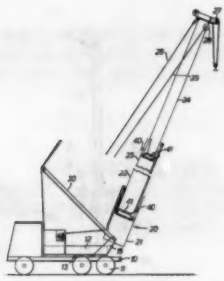
The lower anchor member comprises a sheet metal plate having slots to receive the lower open end of the post and functions to improve the cantilever stability provided by the upper anchor member.

3,727,358
BUILDING CONSTRUCTION WITH SLOPING FOUNDATION SILL AND VERTICAL UNDERPINNING
Venice T. Howell, 1421 Cabrielo Avenue, Burlingame, Calif.
Continuation-in-part of Ser. No. 43,750, June 5, 1970, abandoned. This application Aug. 4, 1971, Ser. No. 168,822
Int. Cl. E02d *27/00;* **E04b** *1/38*
U.S. Cl. 52—169 **10 Claims**



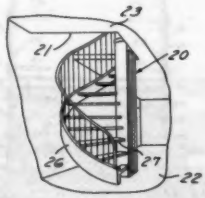
A building construction wherein a foundation has a sloping top surface corresponding generally to the slope of the ground in which the foundation is disposed, vertical underpinning extending upwardly relative to the foundation, and a framing anchor securing the lower end of the underpinning to the foundation.

3,727,359
CRANES
Willem Frederik Vonck, 5 Coombe Park, Kingston-on-Thames, England
Continuation of Ser. No. 10,957, Feb. 12, 1970, abandoned. This application Jan. 12, 1972, Ser. No. 217,265
Claims priority, application Great Britain, Feb. 12, 1969, 7,645/69
Int. Cl. E04h 12/34
U.S. Cl. 52—121 3 Claims



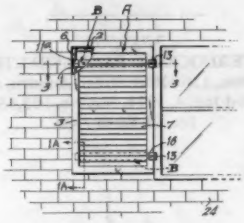
The invention disclosed concerns a telescoping crane having a number of sections which nest one within the other in a contracted condition. Two sets of latch mechanism are disclosed one to hold the telescoped sections in their extended condition and the other to hold them in their contracted condition. The latter mechanism ensure that the tension in the cable used to telescope the sections outwards raises the uppermost section last.

3,727,360
SPIRAL STAIRCASE
Melvin L. Ollman, Detroit, Mich., assignor to C-O, Inc., Detroit, Mich.
Filed March 22, 1971, Ser. No. 126,575
Int. Cl. E04f 11/02
U.S. Cl. 52—187 29 Claims



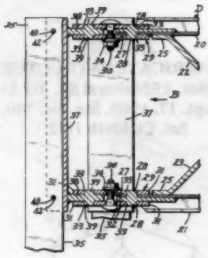
A spiral staircase comprising a hollow column having a semi-circular cross section wherein the wall of said column is under tension. A stringer extends in helical fashion in spaced relation to the outer wall of the column and steps or treads extend between the stringer and the column.

3,727,361
MOUNTING DECORATIVE SHUTTERS OR PANELS ON BUILDING WALLS
Samuel Greene, 18 Underwood Drive, West Orange, N.J.
Filed July 26, 1971, Ser. No. 166,069
Int. Cl. E04c 2/38; E06b 7/08
U.S. Cl. 52—473 6 Claims



The invention contemplates a combination including a simulation of a window shutter or a panel, a mounting bracket to be secured on a wall, and a locking member yieldingly separably coactive with a portion of the bracket, whereby the shutter can be tilted and attached to one end of the bracket, then pressed against the bracket and releasably held on the bracket by separable engagement of the locking member with said portion of the bracket, in partially overlying relation to the face of the shutter.

3,727,362
BUILDING LOAD STRUCTURE
Paul E. Ellison, Bloomington, and Richard R. Koehn, St. Louis Park, both of Minn., assignors to Dunham Associates, Inc., South Minneapolis, Minn.
Filed Feb. 1, 1972, Ser. No. 222,543
Int. Cl. E04h 12/00
U.S. Cl. 52—648 15 Claims



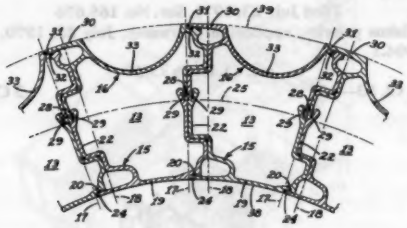
A plurality of each including each including spaced upper and lower chords and horizontal chords interconnecting truss chords, interconnecting the chords, at least one supported at one the by a being supported at connections at the end by of said one supporting column, beams for rigidly connecting said other other end of said one another horizontally beams beam, the rigidly connecting pairs of plate like connector end to an end of another horizontally extending beam, the connections including pairs of plate-like connector elements.

3,727,363

PREFABRICATED TAPERED COLUMNS

Lewis R. Kinsey, 108 So. 25th Street, Phoenix, Ariz.

Filed Dec. 2, 1971, Ser. No. 204,130
Int. Cl. E04c 3/30, 1/10, 1/16
U.S. Cl. 52—731 10 Claims



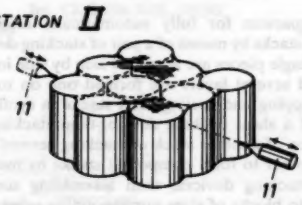
An ornamental, tapered column which is prefabricated from a plurality of identical sections of extruded material to form the angular segments of a circle which, when assembled in a circular relation, form a tapered cylindrical column.

3,727,364

METHOD FOR OPENING PLASTICS-FOIL WRAPPED PACKAGES

Lars Wiking, Taubeyatan 5, Goteborg, Sweden

Filed Aug. 17, 1971, Ser. No. 172,423
Int. Cl. B65b 69/00
U.S. Cl. 53—3 5 Claims



Uniform articles, such as glass bottles and jars, are often for transportation formed into packages which are wrapped in a thermo-shrinking plastic foil. Such foil is very strong and the opening of such packages have proven to be a very tedious operation. When large quantities of such packages are to be handled the opening must be performed automatically in a machine and to that end the packages must be of uniform size and shape. Even if the foil is very strong it often happens during the shrinking operation, or later during transportation, that the basically parallel-epiped package is deformed, which means that the individual articles are interlocked still harder and the removal of the wrapper made more difficult. The invention proposes the injection of a suitable lubricant in finely divided state into the package prior to the removal of the wrapper. It will then be remarkably easy to rearrange the articles within the package and to peel off the wrapper therefrom.

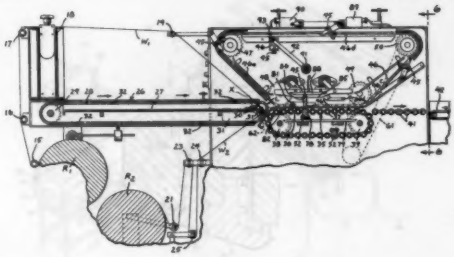
3,727,365

METHOD AND APPARATUS FOR WRAPPING ARTICLES

Roger H. Stohlquist, Rockford, Ill., assignor to Anderson Bros. MFG. Co., Rockford, Ill.

Filed April 29, 1971, Ser. No. 138,525
Int. Cl. B65b 11/10, 53/02
U.S. Cl. 53—33 15 Claims

Upper and lower webs of heat sealable material are joined to form a curtain of material extending across the article path and articles are advanced in succession into one side of the curtain while pairs of jaws at the other side of the curtain are moved laterally of the article path into position between the trailing side of one article and the lead side of a succeeding article and the jaws are thereafter moved forwardly along the article path to advance an article by pushing engagement therewith through the curtain while severing overlapping portions of the web between adjacent articles and sealing overlapping portions at opposite sides of the line of severance. The upper and lower webs of material are pressed against the upper and lower sides of the article to hold the webs in frictional contact with the article and inhibit stressing of the joint between the upper and lower webs at the lead side of the article during wrapping of the same.

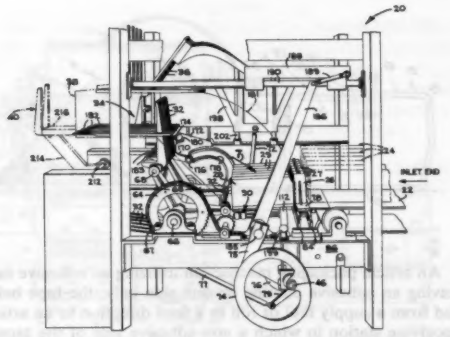


3,727,366

CASING MACHINE

David F. Schlueter, Hoopeston, Vermilion, Ill., and Myron C. Noble, St. Joseph, Ind., assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 757,876, Sept. 6, 1968. This application Oct. 19, 1970, Ser. No. 82,042
Int. Cl. B65b 57/10, 35/40
U.S. Cl. 53—61 7 Claims



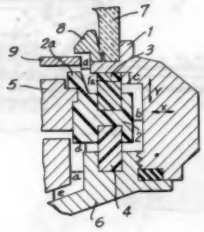
Upright containers are fed into the casing machine from a multiple lane supply line, assembled into one tier, and the tier is transferred and reoriented by tiering fingers which deposit the containers in a tiering chamber. The open end of an empty case is manually positioned adjacent the tiering chamber, and pusher feet insert the tier in the case. A feature of the casing machine is a rocking differential which smoothly accelerates and decelerates the tiering fingers to prevent damage to the containers. Other features include a timing pin and chain mechanism which can be manually adjusted to control the number of tiers loaded into a case, rapid change structure in the zone where the tiers are assembled so that the machine is readily adaptable to handle a range of container sizes, and a lowerator mechanism under positive mechanical control for gently lowering the loaded cases to a discharge position.

3,727,367

SHOCK PROOF WATCHCASE

Yoshiaki Fujimori, 3091-1, Konami, and Ikuo Tokunaga, 3-5, 3-chome, both of Suwa, Japan

Filed Oct. 7, 1971, Ser. No. 187,261
Claims priority, application Japan, Oct. 8, 1970, 45/87857
Int. Cl. G04b *37/04*
U.S. Cl. 58—88 C 8 Claims



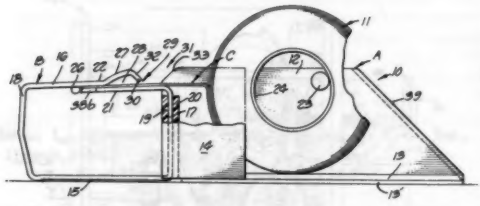
A shock-proof watchcase having a shock-absorbing member supported between the case body and back cover. The watch movement is mounted on said shock-absorbing member. The shock-absorbing member is adapted to absorb shocks both in the axial and transverse directions of the watch.

3,727,368

ARTICLE PACKAGING MECHANISM UTILIZING AN ADHESIVE TAPE

William S. West, 120 S. Sierra Madre, Apt. 202, Pasadena, Calif.

Filed March 18, 1971, Ser. No. 125,533
Int. Cl. B65b *51/06, 51/08*
U.S. Cl. 53—135 4 Claims



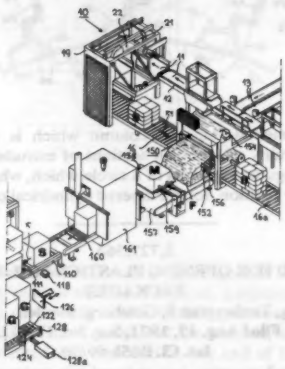
An article packaging mechanism utilizing an adhesive tape having an adhesive coating on one side only, the tape being fed from a supply reel or roll in a feed direction to an article receiving station in which a non-adhesive side of the tape is slidable over an outwardly projecting first finger member, the adhesive side being exposed. Beyond the article receiving station, the leading end of the tape is positioned between the end portion of the first finger and an overlapping end portion of an inwardly projecting finger, these end portions being resiliently pressed toward each other so that the leading end of the tape will adhere to the end portion of the second finger member. The received article adheres to the tape, and when moved together with it to a position beyond the receiving station between the overlapping finger portions, the tape will be reversely looped within a loop-forming space formed by one of the fingers, and carried around the article to provide an adhesively secured band therearound with outwardly projecting adhered end portions which can be severed at a predetermined length by translatory lateral movement against an adjacent cutting edge at the end terminus of the first finger member.

3,727,369

FULLY AUTOMATIC APPARATUS FOR LOADING CONTAINERS WITH SINGLE PIECES ASSEMBLED IN SHEET-WRAPPED STACKS, SUCH AS SACKS OR THE LIKE

Harry Lassig, 2000 Hamburg-Schenefeld, Muhlendamm, Germany

Filed July 23, 1971, Ser. No. 165,676
Claims priority, application Germany, July 25, 1970, P 20 37 004.1
Int. Cl. B65b *35/52*
U.S. Cl. 53—159 3 Claims



An apparatus for fully automatically assembling single pieces in stacks by means of a pair of stacking devices in which several single pieces are arranged side by side in the form of a layer and several layers are formed one on top of another, then wrapping and sealing such stacks in synthetic sheet by means of a sheet packing device, then stacking such stacks one on top of another stack or stacking several stacks on top of each other to form compound stacks by means of one or several stacking devices, then assembling such compound stacks into blocks of sizes corresponding substantially to the dimensions of the interior cargo space of a container by means of a transfer and storage conveyor, and finally sliding such blocks into the containers. In one embodiment, the stacks are wrapped in plastic sheet prior to compound stacking. Two containers may be loaded alternately. The apparatus comprises various conveyors and transfer devices for feeding the single pieces, the stacks, the compound stacks and the assembled blocks through the apparatus to tilting frames on which the containers may be mounted. The drive means of the various devices and conveyors may be coupled through control means to a common program controller.

3,727,370

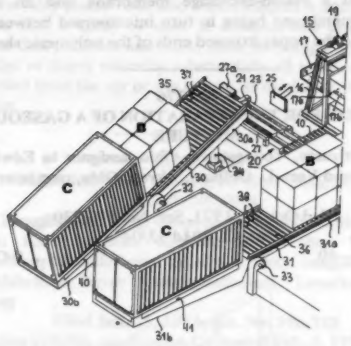
APPARATUS FOR LOADING CONTAINERS

Harry Lassig, 2000 Hamburg-Schenefeld, Muhlendamm, Germany

Filed July 23, 1971, Ser. No. 165,677
Claims priority, application Germany, July 25, 1970, P 20 37 003.0
Int. Cl. B65b *35/52*
U.S. Cl. 53—159 7 Claims

There is disclosed a method and an apparatus for loading containers with single pieces by which a plurality of single pieces are stacked on top of each other and subsequently several stacks are assembled into a block having a size substantially corresponding to the dimensions of the freight space of the container. In one embodiment, the pieces are enveloped in plastic sheet prior to stacking. Two containers may be loaded alternately. The apparatus comprises one or several

stacking devices for stacking the single pieces, a packing device if desired and various conveyors and transfer devices for feeding the stacks to a tilting frame on which the container



may be mounted. Loading of the assembled blocks of single pieces into the container is effected by tilting the tilting frame. The drive means of the various devices may be coupled through control means to a common program controller.

3,727,371

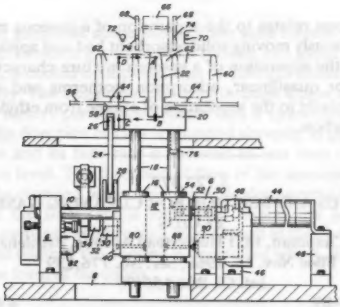
TRAY LOADING AND INDEXING MECHANISM

Raymond Lorenzini; Thomas L. Vieira, and Robert G. Wallace, all of Rochester, N.Y., assignors to Eastman Kodak, Rochester, N.Y.

Filed Nov. 12, 1971, Ser. No. 198,358

Int. Cl. B65b *5/06, 35/30*

U.S. Cl. 53—246 **8 Claims**



A tray loading and indexing mechanism for successively loading one or more articles into each compartment of a tray having a plurality of adjacent compartments. The loading and indexing mechanism has an elevator bar that is movable in a substantially rectangular path, and during such movement loads one or more articles into one compartment at a loading station, and then indexes the tray one compartment space to position the adjacent empty compartment at the loading station.

3,727,372

BAG PACKAGING SYSTEM

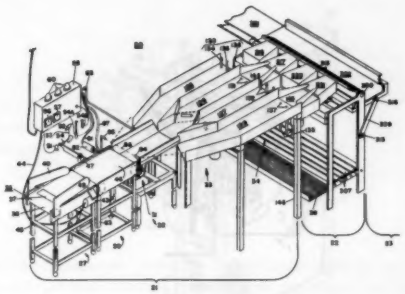
John T. Roberts, Simpsonville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 9,869, Feb. 9, 1970. This application Sept. 20, 1971, Ser. No. 182,161

Int. Cl. B65b *57/00*

U.S. Cl. 53—59 W **1 Claim**

Apparatus and method for classifying products to be packaged, distributing the classified products to index positions corresponding to their classifications and holding the classified products for packaging, indexing bags into product loading positions corresponding to the index positions by conveying imbricated taped bags into loading positions keyed to



the classifications, inflating the taped bags, inserting the indexed items into the bags and removing the loaded bags from the loading position, conveying the loaded bags to an evacuating and closing position, evacuating and closing the bags and subsequently shrinking the bags.

3,727,373

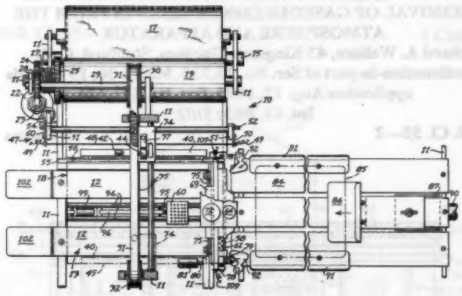
BAG FORMING FILLING AND SEALING APPARATUS

Norman M. MacLeod, P. O. Box 4175, Chattanooga, Tenn.

Filed Jan. 20, 1972, Ser. No. 219,338

Int. Cl. B65b *5/02, 43/04, 43/30*

U.S. Cl. 53—183 **16 Claims**

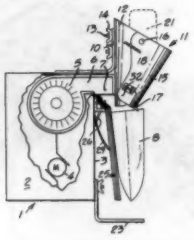


An apparatus for forming, filling and sealing a bag at a single station. A continuous strip of U-folded sheet material is fed transversely across the station intermittently in increments equal to the width of the completed bag. A single severing and sealing mechanism is positioned on the side of the station from which the material is fed to sever the sheet material and simultaneously seal both severed edges of the material between each feeding cycle. Suction means are provided for separating the free edges of the open end of the bag. Ram means may be provided for inserting an article into the open end of the bag. Closing means are provided for sealing the free edges of the bag after it is filled, and ejection means may be provided for removing the filled bag from the station.

3,727,374
BAG FILLING DEVICE

Donald S. Williams, 1705 Notre Dame, Belmont, Calif.

Continuation-in-part of Ser. No. 869,431, Sept. 11, 1969. This application Nov. 10, 1971, Ser. No. 197,214
Int. Cl. B65b *43/36*
U.S. Cl. 53—189 9 Claims

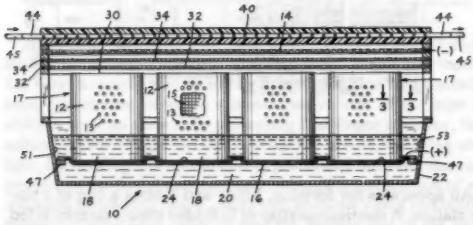


The flaps of a stack of plastic bags are clamped by a releasable clamp below the exhaust nozzle of the blower of a packing device, in such position that the airflow blows the top of the outermost bag open away from the stack; above the bag is a feed chute or guide adjustably mounted on the top of the blower, having a pivoted half on a transverse pivot so that it may swing outwardly away from the blower; skirt flanges extending from the lower edge of this pivoted half project into the opened bag so as to keep it open when the pivoted half is swung outwardly by the package or item to be packed; on each side of the pivoted half is a hinged flap swingable outwardly to hold the sides of the bag open when a wider package or article is dropped through the feeding guide; the pivoted half is sufficiently wide to extend substantially beyond the sides of the stationary half of the guide.

3,727,375
CONTINUOUS ELECTROMIGRATION PROCESS FOR REMOVAL OF GASEOUS CONTAMINANTS FROM THE ATMOSPHERE AND APPARATUS

Richard A. Wallace, 43 Kingscote Gardens, Stanford, Calif.

Continuation-in-part of Ser. No. 23,733, March 30, 1970. This application Aug. 12, 1971, Ser. No. 171,121
Int. Cl. B03c *9/02*
U.S. Cl. 55—2 9 Claims

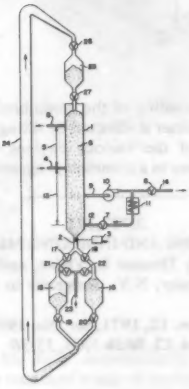


A continuous process for removal of gaseous contaminants, particularly carbon dioxide, from an atmosphere containing the same, which comprises subjecting the gaseous contaminant laden atmosphere to contact with strongly basic ionic polymer sheet under the influence of an applied electrical field. The apparatus for accomplishing this comprises at least one and preferably a plurality of cylindrically shaped perforated reinforced sheets, in strip form, of strongly basic ionic polymeric material partially suspended at the lower end thereof into a circulating stream of sea water, the polymeric cylindrically shaped sheets being interspersed between a source of an appiable electric field, e.g., a cathode and an anode, and a cation-exchange membrane and an anion-exchange membrane being in turn interspersed between the cathode and the upper exposed ends of the polymeric sheets.

3,727,376
PROCESS FOR THE SEPARATION OF A GASEOUS MIXTURE

Leslie V. Szirmay, Youngstown, Ohio, assignor to Edwin W. Oldham and Vern L. Oldham, Akron, Ohio, part interest to each

Filed Oct. 20, 1971, Ser. No. 190,730
Int. Cl. B01d *53/04*
U.S. Cl. 55—60 9 Claims

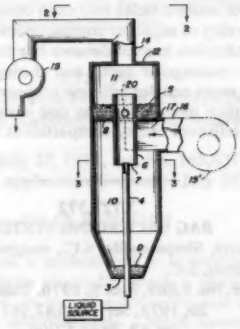


This process relates to the separation of a gaseous mixture on a continuously moving solid adsorbent bed and applies particularly to the separation of a gaseous mixture characterized by linear, or quasilinear, adsorption isotherms and applies most particularly to the separation of ethane from ethylene on activated carbon.

3,727,377
APPARATUS AND METHOD FOR CLEANING GASEOUS FLUIDS

Harlow M. Chapman, 1821 Homestead Avenue, Bethlehem, Pa.

Filed Nov. 15, 1968, Ser. No. 776,139
Int. Cl. B01d *50/00*
U.S. Cl. 55—89 6 Claims



The invention resides in dust collecting apparatus combining the principles of so-called "dry-cyclone" and "wet-

cyclone" dust collectors, subjecting dust-laden air or gas successively to centrifugal action first in a "dry-phase" vortex during which relatively large entrained particles, particularly together with some of the smaller ones are ejected from the air or gas stream which then enters a "wet-phase" vortex coaxial with the "dry-phase" one into which a liquid is introduced and broken into a spray or mist to dampen and coagulate the smaller dust particles and effect their centrifugal separation in a sludge or slurry whereby substantially all solid particles are extracted from the air or gas before its discharge from the apparatus.

3,727,378

PROCESS FOR COOLING HOT GAS/SOLIDS SUSPENSIONS

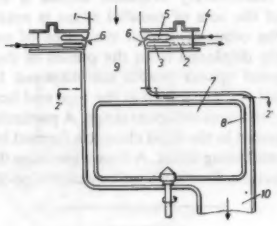
Hans Zirngibl, Duisburg; Klemens Jaschinski, Krefeld-Uerdingen; Karl Brandle, Krefeld, and Walter Weidmann, Duisburg-Muendelheim, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 15, 1971, Ser. No. 106,758

Claims priority, application Germany, Feb. 4, 1970, P 20 05 011.7

Int. Cl. B01d *57/00*

U.S. Cl. 55—72 **9 Claims**



A hot gas/solids suspension, of the kind formed during the reaction between gaseous metal halides and gases containing oxygen, is cooled by introduction of cold gas either radially or annularly. The suspension, flowing through a pipe at about 10 to 100 meters per minute, passes into a cylindrical chamber where its direction of flow is changed abruptly to produce turbulence and its flow rate is reduced to less than one-half its previous level. The direction of flow of the suspension is then abruptly changed again, the chamber discharging into a pipe so that the flow rate is increased. Means are provided to scrape away any solids which may deposit in the chamber.

In this manner the cooling is controlled which, in turn, controls the form of the solids.

3,727,379

PROCESS FOR THE PURIFICATION OF GASES AND VAPORS

Eduard Bijleveld, Soest, and Jan Cleij, Baarn, both of Netherlands, assignors to N. V. Octrooien Maalschappij Activit, Amsterdam, Netherlands

Continuation-in-part of Ser. No. 42,486, June 1, 1970, abandoned. This application April 17, 1972, Ser. No. 244,884

Claims priority, application Netherlands, June 4, 1969, 6908458

Int. Cl. B01d *53/02*

U.S. Cl. 55—73 **9 Claims**

Impurities are removed from gases or vapors, for example, from air polluted with the impurities to be removed, by contacting the gas or vapor with a macroporous insoluble cross-linked copolymer of styrene and divinylbenzene in the form of beads or granules having a specific surface area of at least 10 m^2/g and containing polar and polarizable non-dissociable active groups selected from the class consisting of halogen and nitro- and acetyl-groups.

3,727,380

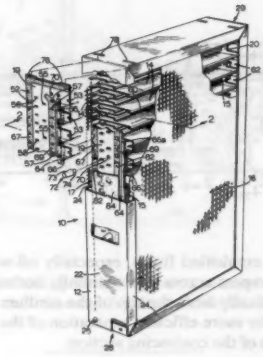
ELECTROSTATIC PRECIPITATOR

Cassius D. Remick, Waterloo, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada

Filed Oct. 18, 1971, Ser. No. 190,211

Int. Cl. B03c *3/08, 3/41, 3/47*

U.S. Cl. 55—138 **7 Claims**



An electrostatic precipitator is disclosed in which identical printed-circuit boards are used at either end of a plurality of collector plates both to provide electrical connections and to space the plates. The plates each have at either end a support tab and a contact tab, both of which register in slots in the respective printed circuit board. The boards have printed bus bars connecting the contact tabs of the plates with the same potential, and these bus bars are coated first with a conductive resilient coating and then with a resilient non-conductive coating.

3,727,381

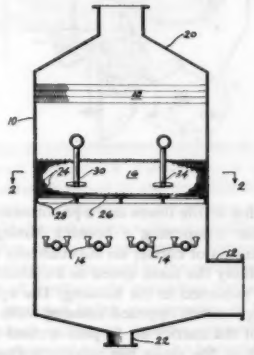
AGITATOR FOR MARBLE BED GAS SCRUBBER

Herbert H. Kreimann, Bloomfield, Conn., assignor to Combustion Engineering Inc., Windsor, Conn.

Filed March 26, 1971, Ser. No. 128,321

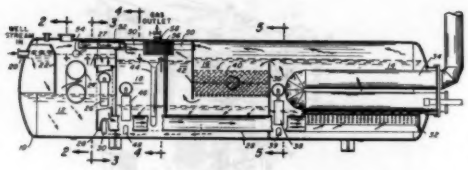
Int. Cl. B01d *46/38*

U.S. Cl. 55—233 **1 Claim**



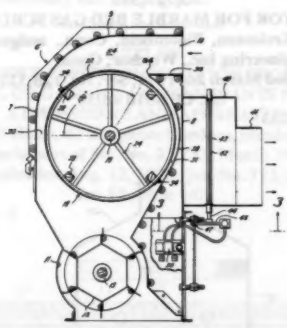
An agitator for a marble bed wet gas scrubber having an upright housing in which the bed of marbles forms a plurality of diverse, tortuous flow paths for the gases. A plurality of horizontally extending nozzles positioned adjacent a perforate support means for the marbles directs jets of high velocity fluid into the bed, thereby preventing plugging of the diverse and tortuous paths.

3,727,382
DOWNFLOW COALESCING FOR EMULSION TREATER
Morden A. Jackson, Barcelona, Spain, assignor to Maloney-Crawford Tank Corporation, Tulsa, Okla.
Filed March 10, 1971, Ser. No. 122,741
Int. Cl. B01d *19/00*
U.S. Cl. 55—160 2 Claims



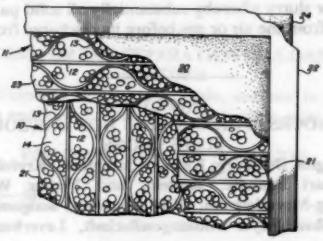
Mixed or emulsified fluids, especially oil-water emulsions, are caused to pass across a substantially horizontal coalescing medium vertically from the top of the medium there across to the bottom for more efficient separation of the phases and self maintenance of the coalescing section.

3,727,383
AIR AND FIBER SEPARATOR
Joseph C. Neitzel, Denton, Tex., assignor to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed Oct. 30, 1970, Ser. No. 85,564
Int. Cl. B01d *50/00*
U.S. Cl. 55—337 7 Claims



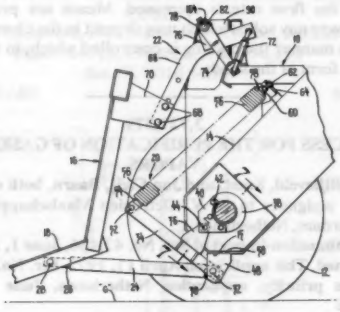
A separator for textile fibers and a pneumatic stream of carrier air therefor comprising a housing having an inlet for directing the stream of carrier air substantially tangentially of and at substantially the same speed as a cylindrical drum surface rotatively mounted in the housing. The cylindrical drum wall closely approaches opposed housing walls for restricting the tendency of the carrier air to pass around the drum. The cylindrical wall of the drum has relatively fine perforations, but the total area of perforations in any portion of the cylinder wall which spans the casing interior between the inlet and the first of said opposed housing walls substantially greater than the cross sectional area of the inlet. The resulting reduction in velocity of the carrier air together with movement of the drum surface substantially at the speed of and in the same direction as the transported fibers results in continuation of the fibers around the drum due to inertia, while the carrier air tends to pass into the drum.

3,727,384
CONTACT ELEMENT
Elliot I. Feldman, 2850 E. Second Street, Tucson, Ariz.
Filed April 24, 1972, Ser. No. 246,947
Int. Cl. B01d *50/00*
U.S. Cl. 55—484 1 Claim



A reactant element for contacting a stream of fluid such as air or other gas or liquid with a particulate reactant. The particulate reaction is retained in a core structure specially constructed to resist deflection by fluid moving through the element. The core structure consists of two sets of parallel stiffening strips transversely disposed across a moving fluid stream. One of the sets of parallel strips is rotationally displaced from the other such that the strips of one set lie in planes angularly displaced from the planes of the first set of strips. Corrugated spacer sheets are disposed between the strips of each set and are joined at the tops and bottoms of the corrugations to the next-adjacent strips. A particulate reactant material is disposed in the fluid channels formed by the spacer sheets and the stiffening strips. A frame encloses the periphery of the core structure, forming a unitary cartridge-like element.

3,727,385
AGRICULTURAL VEHICLE
William H. Twidale, Islington, Ontario, and Mark K. Byrnes, Mississauga, Ontario, both of Canada, assignors to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Nov. 26, 1971, Ser. No. 202,214
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 12 Claims



A ground vehicle having an implement attached at one end of the vehicle for pivotal movement relative to the ground. The implement may be a swather table or the like which is equipped with a pair of power activated lift cylinders for selective raising or lowering of the swather table. The lift cylinders are interconnected between the swather table and one end of a rocker arm which is pivoted to the frame of the vehicle. A pair of counterbalancing springs are co-operatively positioned relative to the lift cylinders and have one end attached to the

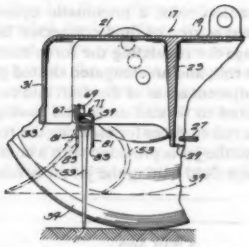
frame of the vehicle and the other end of the pivotal rocker arm. The upper end of the swather table is supported for pivotal fore and aft movement on a transverse crossbar which is rotatable in the frame of the vehicle. The outer ends of the table-supporting crossbar are each connected to an interconnected lift arm and lever assembly for rotation of the crossbar within the frame upon respective pivotal movement of the swather table. The transverse cross bar defines a torsion rod adapted to maintain the table in level position, and one of the lift arm and lever assemblies is provided with adjusting means for adjustment of the torque characteristic of the torsion spring.

3,727,386

FLEXIBLE REAR SHIELD FOR ROTARY LAWN MOWER

Herbert A. Jespersen, and Earl H. Kidd, both of Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed June 6, 1972, Ser. No. 260,128
Int. Cl. A01d *67/00, 35/12*
U.S. Cl. 56—320.1 **7 Claims**



Disclosed herein is a rotary lawn mower comprising a blade housing including a top deck, a generally annular wall depending from the top deck and substantially enclosing a cutter blade, and a rear wall depending from the top deck, extending generally transversely of the direction of intended travel, and spaced rearwardly from the annular wall. Also disclosed is pivot means supported by the blade housing and having a transversely extending axis adjacent to the rear wall, and a flexible shield carried by the pivot means for pivotal movement about said axis, extending across substantially the entire distance between the rear wheels supporting the blade housing, and extending in closely adjacent relation to the ground, not withstanding variation in the vertical distance of the blade housing above the ground. Also disclosed is spring means extending forwardly and rearwardly of the shield for yieldably limiting movement of an upper portion of the shield from a position adapted to locate a lower portion of the shield in closely adjacent relation to the ground.

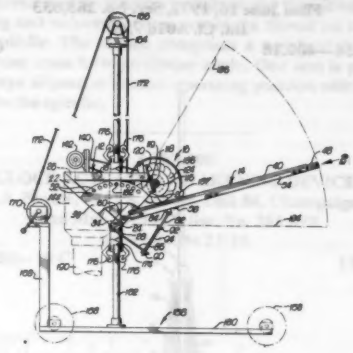
3,727,387

FRUIT HARVESTER

Francis G. Sorensen, 6333 South Friends Avenue, Whittier, Calif.

Filed March 20, 1969, Ser. No. 808,799
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 R **15 Claims**

A fruit harvester of the tree-combing type in which the tines are movable relative to one another to clear obstructions in the tree. A rotatable helix, positioned over the rear portion of the tines, cooperates with branch-holding devices carried by the tines to gently separate the fruit from the branches. The



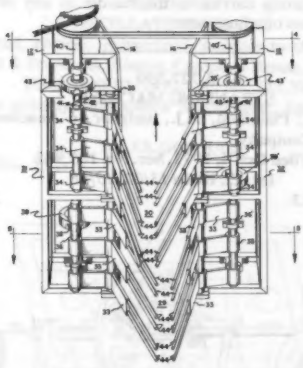
tines are tapered along their lengths to present small frontal cross-sections and thereby facilitate insertion into the tree crown.

3,727,388

GRAPE HARVESTER

Leslie V. Smith, 112 North 22nd Avenue, Yakima, Wash.

Filed Aug. 16, 1971, Ser. No. 171,830
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 **2 Claims**

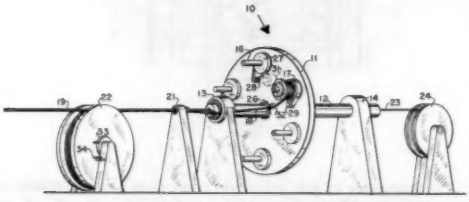


The harvester of this invention comprises a substantially U-shaped inverted framework carried by a pair of wheels mounted on axles disposed at the opposite terminal sides of the framework; an entranceway including a pair of opposing substantially V-shaped guide walls, inwardly projecting with respect to the direction of travel, depending from the framework and being disposed in the entranceway of the harvester; a pair of rectilinearly extending opposing flexible collector floor portions being coextensive in length with the framework, each collector issuing upwardly at an angle toward the centermost portion of the harvester and being engageable with vines planted in rows; and a multiplicity of vine engaging shaker panel assemblies disposed vertically with respect to the ground, one panel being mounted above another panel, each of the panels including a plurality of opposing pairs of shaker rods carried in brackets operable to oscillate transversely in unison to move a portion of the vine being harvested in one direction while the next succeeding shaker panel moves the portion of the vine in a direction opposite.

3,727,389
COLLAPSIBLE RAKE
Fred J. Huspen, 705 Lincoln St., Glenview, Ill.
Filed June 16, 1972, Ser. No. 263,633
Int. Cl. A01d *7/00*
U.S. Cl. 56—400.18 **6 Claims**

An adjustable rake including an elongated handle having a transverse prong guide secured thereto at one end thereof. Mounted on the handle for slidable movement is a prong carrier and it in turn pivotally mounts respective ends of a plurality of prongs which extend therefrom through the prong guide. By changing the position of the carrier on the handle, the width of swath of the rake can be regulated. Means are provided for securing the prong carrier to the handle at any of several desired positions of adjustment.

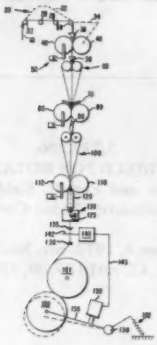
3,727,390
STRANDING MACHINE
Olek Schwarz, Plainfield, N.J., assignor to Anaconda Wire and Cable Company
Filed Oct. 4, 1971, Ser. No. 185,982
Int. Cl. H01b *13/02, 13/08*
U.S. Cl. 57—13 **3 Claims**



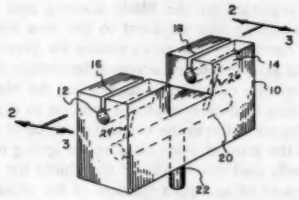
In a stranding machine the reels of wire mounted on the machine are braked by hysteresis brakes and the current through these brakes is reduced by the switching of resistors into the brake circuit as preselected numbers are reached in pulse counters for pulses generated by the strand take-up capstan.

3,727,391
APPARATUS FOR DRAFTING AND TWISTING FIBERS
Franklin Raymond Hiserman, Jr., Waynesboro, and Keith Harold Turley, Staunton, both of Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 4, 1971, Ser. No. 195,573
Int. Cl. D01h *5/26, 5/52, 5/72*
U.S. Cl. 57—36 **5 Claims**

In a machine for drafting staple fibers into yarn including a plurality of vertically spaced sets of drafting rolls, each set including at least two driven drafting rolls, each set including at least two driven drafting rolls and associated cot rolls in a nip forming relationship, and removable double apron assemblies positioned between adjacent sets of drafting rolls all mounted to the machine frame, a jet twister for consolidating the fibers and a windup for the yarn, an apparatus for improving the handling of fibers during drafting. The apparatus comprises a forked arm mounting a pair of cot rolls for rotation, a multipoint linkage connecting the forked arm to the frame, providing for spacial movement of said cot rolls with respect to the axis of their companion rolls, a pneumatic cylinder with a regulated, pressurized source of fluid connected between the frame and the linkage for regulating the force exerted by the cot roll on the draft roll, and an elongated slotted guide freely riding the nip and adjacent areas of the draft and cot rolls, said guide being contoured to fit said areas and having a fibrous surface adjacent the roll surfaces for cleaning the roll surfaces. An enclosure around the jet is provided with a coanda surface below the jet to direct fluid exiting the jet away from the yarn path.



3,727,392
FIBRILLATION JET
John D. Gibbon, Charlotte, N.C., assignor to Fiber Industries, Inc.
Continuation-in-part of Ser. No. 70,713, Sept. 9, 1970. This application March 31, 1971, Ser. No. 129,738
Int. Cl. D02g *3/00*
U.S. Cl. 57—77.3 **8 Claims**

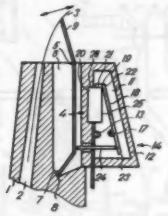


There is provided an improved forwarding jet especially useful where a fibrillatable tape is to be subjected to the action of at least four fluid twisting means. This apparatus is comprised of a housing having a tubular passageway therethrough for the passage of a fibrillatable tape and a fluid manifold for the delivery of pressurized fluid to said tubular passageway. Said tubular passageway is comprised of at least two spaced apart bores of common axis, each of said bores having a fluid passageway tangentially intersecting it at an angle of from about 15° to about 70° with respect to the common axis of said bores. The tangential intersection of the bores is of opposite incidence so that the direction of twist imparted to the tape is reversed between adjacent bores.

3,727,393
THREAD BREAKAGE DETECTOR

Karel Mikulecky, Chocen; Jiri Elias, Brandys Nad Orlici, and Frantisek Filip, Usti Nad Orlici, all of Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti Nad Orlici, Czechoslovakia

Filed Oct. 26, 1971, Ser. No. 192,497
Claims priority, application Czechoslovakia, Nov. 6, 1970, 7459/70
Int. Cl. D01h *13/16*; B65h *63/02*
U.S. Cl. 57—81 14 Claims

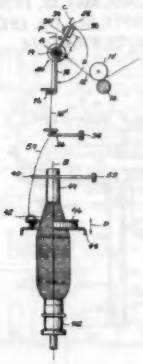


A magnet is mounted in a housing of a thread breakage detector and has an edge bounding a surface. An arm composed at least in part of magnetizable material is fulcrumed on this edge for pivotal movement and has a portion which is displaceable by magnetic attraction from a position remote to a position proximal to the surface of the magnet. An electrical circuit is provided, having at least two contacts at least one of which is carried by the portion of the arm so as to engage the other contact when the portion is proximal to the surface of the magnet, and tension-detecting means in form of a separate rockable lever, or a portion of the arm itself, is provided which cooperates with a tensioned thread and maintains the portion of the arm in its position remote from the surface of the magnet while the thread exerts a predetermined tension.

3,727,394
APPARATUS FOR PREVENTING THE CURLING AND LOOPING OF THE YARN IN A TRAVELER-RING TWISTING MACHINE

Aloys Greive, Munster, Westphalia, Germany, assignor to Hamel GmbH Zwirnmaschinen, Munster/Westf., Germany

Filed Dec. 2, 1970, Ser. No. 94,485
Claims priority, application Germany, April 12, 1969, P 19 60 970.2
Int. Cl. D01h *13/12*
U.S. Cl. 57—106 10 Claims

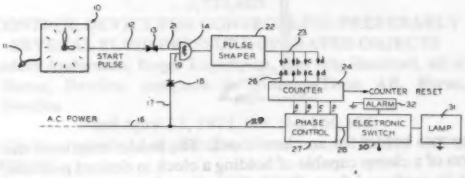


A thread-twisting apparatus comprises a supply device for feeding a thread to a thread-twisting assembly including a spindle and a traveler ring orbiting the spindle. A thread sensor engages the thread between the traveler ring and the supply device and is effective to tighten the thread only upon loosening and reduction of tension in the thread on standstill of the spindle. The device comprises a weighted bent wire lever whose arms form an obtuse angle. One arm is provided with an eye aligned in normal operating position with a guide eye above the spindle.

3,727,395
CLOCK ACTUATED AWAKENING DEVICE

Richard A. Baylor, 1011 S. Mattis, Unit 56, Champaign, Ill.

Filed May 19, 1972, Ser. No. 255,098
Int. Cl. G04c *21/16*
U.S. Cl. 58—19 C 11 Claims

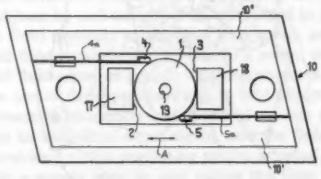


A clock actuated awakening device that gently rouses a sleeper by increasing the power to a lamp as a function of time, thereby increasing the intensity of the light to simulate the sunrise. The intensity of the light is increased either mechanically or electronically.

3,727,396
OSCILLATING MOTOR

Max Hetzel, Bienne, Switzerland, assignor to OMEGA Louis Brandt & Freres SA, Bienne, Canton of Benne, Switzerland

Filed April 12, 1972, Ser. No. 243,392
Claims priority, application Switzerland, April 27, 1971, 6155/71
Int. Cl. G04c *3/02*
U.S. Cl. 58—23 D 9 Claims



An oscillating motor for a watch comprises a driven tuning fork or mechanical resonator driving a ratchet wheel. The fork carries a hermetically sealed housing on one of its tines, the housing enclosing a ratchet wheel fixed with a magnetized disc which constitutes part of a magnetic coupling. The ratchet wheel floats on a liquid film in the housing and is driven by pawls when the fork vibrates. The rotation of the ratchet is conveyed to the watch mechanism by the other half of the magnetic coupling, which is pivotally mounted outside the housing.

3,727,397
CLOCK MOUNTINGS

Eugene L. Ethier, 216 West Simmons Avenue, Anaheim, Calif.

Filed Dec. 16, 1971, Ser. No. 208,724
Int. Cl. G04b *37/14*
U.S. Cl. 58—56 5 Claims

To make the time and the shut-off controls of an alarm clock easily available to a sleeper, the invention combines a

mounting structure which is to be fixed to a wall, headboard of a bed, or simply placed on the floor, with an elongate and flexible arm or conduit which extends from the mounting structure to a holder for an alarm clock. The holder may have the form of a clamp capable of holding a clock in desired position, but in preferred form that holder comprises the case of the clock.

3,727,398

CHRONOGRAPH

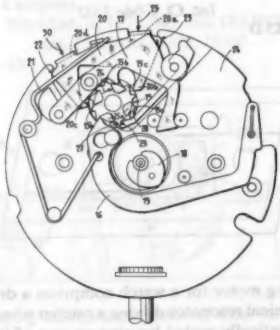
Donald Rochat, Les Bioux, Switzerland, assignor to Valjoux S.A., Les Bioux, Canton of Vaud, Switzerland

Filed May 24, 1972, Ser. No. 256,292

Claims priority, application Switzerland, Nov. 15, 1971, 16574/71

Int. Cl. G04f 7/04

U.S. Cl. 58—74 **3 Claims**



A timepiece such as a timecounter or a chronograph comprising a column wheel, a control member permitting the column wheel to be driven step by step unidirectionally so that the successive operations of the control member produce successively starting, stopping and setting to zero of the hand of the counter or of the chronograph, and which comprises a second control member permitting the column wheel to be driven reversely one step, so that the operation of the second control member, when the counter or chronograph is stopped, effects its restarting.

ERRATUM

For Class 58—88 see:
Patent No. 3,727,367

3,727,399

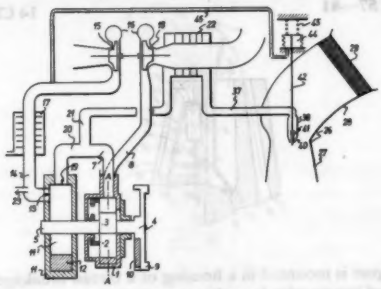
ROTARY-PISTON DIESEL ENGINE SUPERCHARGERS

Maurice Brille, and Yves Baguelin, both of Suresnes, France, assignors to Societe Anonyme de Vehicules Industriels et D'Equipments Mecaniques Saviem, Suresnes, Hauts de Seine, France

Filed March 8, 1971, Ser. No. 121,751

Int. Cl. F02b 37/04

U.S. Cl. 60—13 **13 Claims**



In a supercharging system for Diesel rotary-piston engines comprising a turbosupercharger and a volumetric supercharger, means are provided for drawing air downstream of the volumetric supercharger and utilizing this tapped air in an air pump also receiving the air having passed through the engine radiator, a needle valve responsive to the supercharging pressure controlling the delivery of drawn air into the neck of a convergent divergent section of said pump, this drawn air being also adapted to be injected into the exhaust pipe of the turbine of said turbosupercharger which receives the exhaust gas from the engine, said exhaust pipe being connected in turn to the interior of another pump mounted in the radiator cooling air duct, a needle valve being inserted in the pipe delivering the air derived downstream of said volumetric supercharger, in order to improve the efficiency of the system by reducing the counter-pressure upstream of the exhaust turbine while improving the drawn air output and therefore the air-pump throughput and the engine radiator cooling air output, said needle valve being responsive to this end to a spring-loaded bellows responsive in turn to the supercharging pressure.

3,727,400

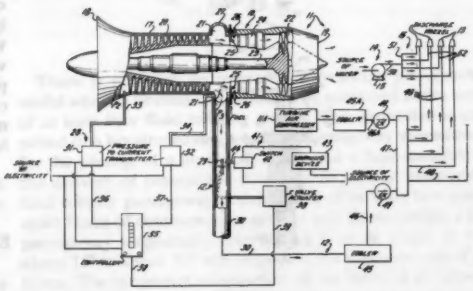
GAS TURBINE AIR COMPRESSOR AND CONTROL THEREFOR

Emmett S. Harrison, Corona, N.Y., and August H. Zoll, Cedar Grove, N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Division of Ser. No. 41,509, May 28, 1970. This application June 10, 1971, Ser. No. 151,794

Int. Cl. F02c 9/14

U.S. Cl. 60—39.29 **2 Claims**



A gas turbine air compressor which has an air by-pass connected to a place of use or storage is provided with an over-

load prevention system to avoid excessive by-pass of compressed air and the consequent overheating and failure of the combustor and turbine components of the gas turbine compressor.

3,727,401

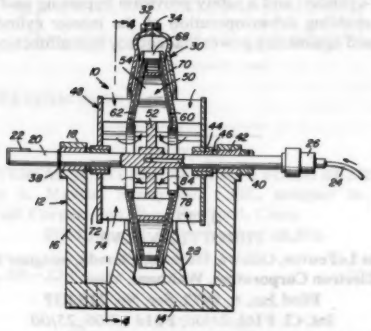
ROTARY TURBINE ENGINE

Julian D. Fincher, P. O. Box 294, Pensacola, Fla.

Filed March 19, 1971, Ser. No. 125,931

Int. Cl. F02c *3/16*

U.S. Cl. 60—39.35 **6 Claims**



Intake air undergoes two stage compression within a pair of co-axially mounted, counter-rotating rotors of a radial turbine engine and is tangentially discharged into a turbine mounted by one of the rotors. The air is heated and accelerated by discharge of combustion products from fuel burners mounted on the second stage compressor vanes in the other of the rotors to produce reaction thrust. Extensions of some of the second stage compressor vanes form discharge passages for the mixture of air and combustion products.

3,727,402

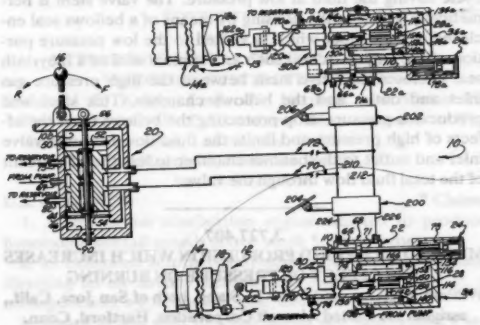
HYDROSTATIC TRANSMISSION SPEED AND STEERING CONTROL SYSTEM

Errol W. Keith, Marshall; Jack Watson, Tekonsha, and Edward J. Bojas, Marshall, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed June 30, 1971, Ser. No. 158,455

Int. Cl. F15b *13/06*

U.S. Cl. 60—444 **22 Claims**



An improved apparatus for controlling the operation of a plurality of hydrostatic transmissions includes a plurality of fluid motors which are connected with the hydrostatic transmissions and are operable to vary the speed and direction of operation of the hydrostatic transmissions. A speed control and reversing valve is operable to effect contemporaneous operation of each of the fluid motors to increase or decrease the operating speeds of the hydrostatic transmissions by the same amount. Steering control valves are connected between the speed control valve and the fluid motors. These steering control valves are operable to effect a change in the speed of a selected one or both of the hydrostatic transmissions to thereby change the direction of movement of an associated vehicle. Upon operation of one of the steering valves, opposite sides of a piston in the associated fluid motor are connected in fluid communication to effect operation of the fluid motor and a variation in the swash angle of the associated hydrostatic transmission.

3,727,403

CONTROL DEVICE FOR CONTROLLING PREFERABLY SEVERAL FLUID PRESSURE OPERATED OBJECTS

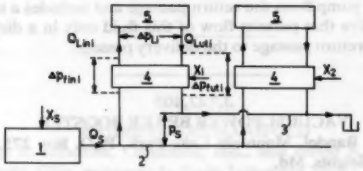
Anders Andersson; Roger Lagerqvist, and Stig Stenlund, all of Boras, Sweden, assignors to Monsun-Tison AB, Boras, Sweden

Filed April 21, 1971, Ser. No. 136,155

Claims priority, application Sweden, April 21, 1970, 5509/70

Int. Cl. F15b *13/06*

U.S.Cl.60—427 **3 Claims**



A control device is provided for controlling fluid pressure operated objects by individual valves connected in parallel to a common fluid pressure source and to a sump, and for unloading said fluid pressure source and to a sump, and for unloading said fluid pressure source when no object is operated. Said valves are of the type imparting to said objects, respectively, a direction of motion and speed of motion depending solely upon an individual input signal, and the fluid pressure source is provided with a regulating means adapted, partly, to maintain in a supply pipe to said valves the flow rate sufficiently high for supplying any operated object with a flow rate that cannot be diminished below the flow rate corresponding to the input signal to the corresponding valve by more than a limited quantity and, partly, to prevent the system pressure from exceeding the highest pressure demand of the objects operated at any moment, and, in case of controlling an energy delivering object or in case of no load operation, from exceeding the pressure level of the system sump by more than a value acceptable with respect to the efficiency.

3,727,404

HIGH PRESSURE STEERING SYSTEM

Lee M. Brewer, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

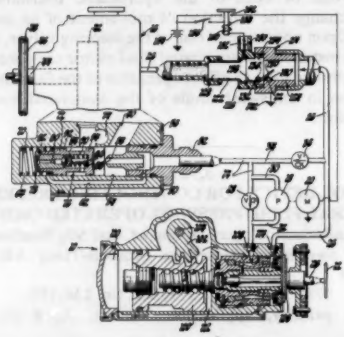
Filed Dec. 8, 1971, Ser. No. 205,848

Int. Cl. F15b *15/18*

U.S.Cl.60—430 **5 Claims**

A flow-valve-controlled fluid motor for operating the steering linkage of an engine-powered vehicle is connected with an engine-driven primary pump by a delivery passage and a

return passage. An electric-motor-driven auxiliary pump and a first check valve are connected in parallel in the delivery passage so that the check valve normally permits flow only in a direction from the primary pump to the fluid motor when the primary but not the auxiliary pump operates and conditions the auxiliary pump to boost the pressure of the fluid from the primary motor when both pumps operate. A flow switch connected in the return passage includes a normally-closed switch



that is connected in series with a vehicle battery and ignitior switch and is operative to actuate the electric motor driving the auxiliary pump until opened by a flow at rates above a predetermined flow rate. A bypass passage connected between the return and delivery passages provides fluid to the auxiliary pump from the return passage and includes a second check valve that permits flow of this fluid only in a direction from the return passage to the delivery passage.

3,727,405

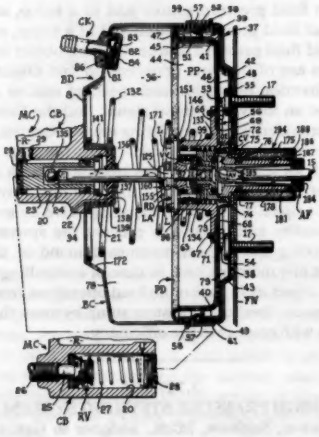
VACUUM-POWER BRAKE BOOSTER

Glenn T. Randol, Mountain Lake Park, P. O. Box 275, Loch Lynn Heights, Md.

Filed Oct. 13, 1970, Ser. No. 80,267

Int. Cl. F15b *7/00*

U.S. Cl. 60—54.5 P **29 Claims**



A vacuum-power booster incorporating a master brake cylinder for producing the major portion of the actuating force for the latter under an improved manual follow-up control valve of the poppet-type operably related with a multilever force and reaction-transmitting mechanism normally ineffective to transmit reaction from master cylinder pressures during manual slack take-up operation and including selective fulcrum blocks carried by the booster output element and replaceable at will to "custom-fit" pedal pressure to the sensitivity the driver desires; a provision for spring resistance to initial pedal depression supplemented by said reaction mechanism, to produce a two-stage transferral of reaction to the brake-pedal for predictable braking control; a provision for detachably connecting three cup-shaped members (metallic shells) to produce the booster power-cylinder and to anchor the outer margin of the diaphragm portion of the power-member airtight therein; a provision for a sleeve-like flexible member adapted to slidably support and seal that portion of said control valve projecting to the exterior of said power-cylinder; and a safety provision bypassing said control valve enabling driver-operation of the master cylinder as a safeguard against any power inadequacy or malfunction otherwise.

3,727,406

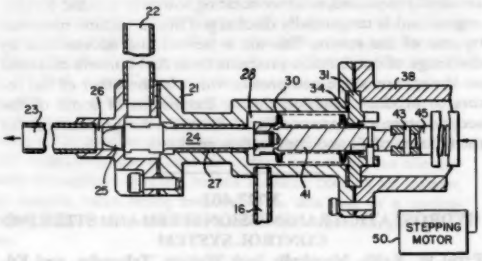
THROTTLE VALVE

Thomas LeFeuvre, Ottawa, Ontario, Canada, assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 6, 1972, Ser. No. 215,837

Int. Cl. F16k *21/00*; **F01d** *17/00, 25/00*

U.S. Cl. 60—108 **5 Claims**



A throttle valve for use in a closed fluid cycle engine where the fluid is passed through the valve at high temperature and pressure and where the engine includes portions of the fluid cycle having the fluid at low pressure. The valve stem is hermetically sealed to the housing by means of a bellows seal enclosed in a chamber which is vented to the low pressure portion of the engine. A seal such as a laminar seal or a labyrinth seal encloses the valve stem between the high pressure gas inlet and outlet and the bellows chamber. This stem seal produces a pressure drop protecting the bellows from the effects of high pressure and limits the fluid flow from the valve inlet and outlet to the bellows chamber to less than 5 percent of the total fluid flow through the valve.

3,727,407

METHOD OF HYBRID PROPULSION WHICH INCREASES THE EFFECT OF PRESSURE ON BURNING

William A. Rains, and Peter L. Stang, both of San Jose, Calif., assignors to United Aircraft Corporation, Hartford, Conn.

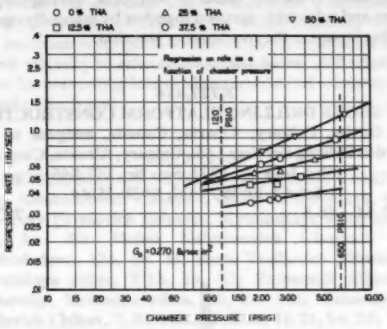
Filed Nov. 20, 1964, Ser. No. 414,053

Int. Cl. C06d *5/06, 5/10*

U.S. Cl. 60—220 **13 Claims**

The present invention relates to solid propellant composi-

tions and more particularly to a composition for the solid



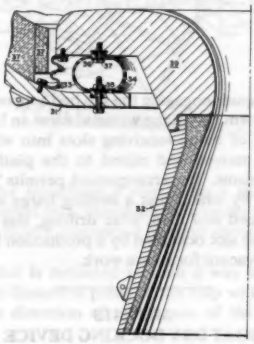
phase of a hybrid motor.

3,727,408

UNIVERSAL JOINT EMPLOYING A FLUID BEARING

Stephen A. Martin, Sunnyvale, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed June 22, 1970, Ser. No. 48,356
Int. Cl. F02k *1/24*
U.S. Cl. 60—232 **21 Claims**



A universal joint permitting the relative axial angular deflection of two axially spaced apart members comprising a body of fluid disposed between said first and second members and confined therebetween by a deformable membrane maintained in tension by the fluid. The use of such a seal as the load bearing seal in a movable exhaust nozzle assembly is disclosed.

3,727,409

HYPERSONIC AIRCRAFT ENGINE AND FUEL INJECTION SYSTEM THEREFOR

Archibald P. Kelley, Leslie W. Norman, and Walter H. Thompson, Jr., all of Scottsdale, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed March 30, 1961, Ser. No. 99,431
Int. Cl. F02k *7/08*
U.S. Cl. 60—270 **7 Claims**

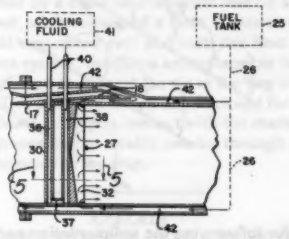
1. A detonation combustion engine adapted to produce hypersonic aircraft speeds above Mach 5, comprising:

a. an elongated aerothermodynamic duct for receiving and directing an air stream therethrough and having an inlet, a mixing section, a combustion zone, and an exhaust;

b. means in said duct for establishing and maintaining a series of shock waves in said duct between said inlet and said combustion zone with an attendant increase in static pressure and static temperature sufficient to create and support detonation combustion in said combustion zone;

c. means for removing boundary layers from the air stream passing through said duct so as to maintain supersonic laminar flow as the stream passes from the inlet to the combustion zone; and

d. means immediately downstream said boundary layer removing means for injecting fuel into said air stream at the



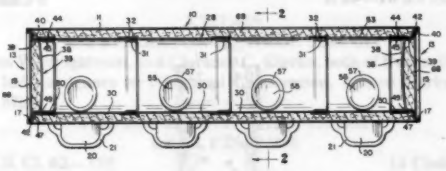
upstream end of said mixing section without interfering with said series of shock waves and said supersonic laminar flow, such fuel injection means having a sharp edge on the upstream side thereof, an elongated slot in its downstream edge, and extending between the inner surfaces of the top and bottom of the aerothermodynamic duct.

3,727,410

EXHAUST GAS MANIFOLD

George E. Scheitlin, Columbus, Ind., and David R. Bentley, Toledp, Ohio, assignors to Arvin Industries, Inc., Columbus, Ind.

Filed Dec. 3, 1971, Ser. No. 204,498
Int. Cl. F01n *7/10*
U.S. Cl. 60—322 **8 Claims**



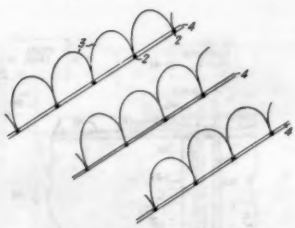
An exhaust gas manifold for an internal combustion engine in which there is provided an outer shell including an outer sleeve having a pair of end caps closing the ends thereof. An inner shell is carried within the outer shell and is formed by a plurality of slidably interfit inner sleeves which are supported in spaced relation to the outer sleeve on mounting members mounted on a second pair of end caps closing the ends of said inner shell and connected to said first pair of end caps. A plurality of inlet conduits and an outlet conduit are connected to said outer shell, and a plurality of inlet conduits and an outlet conduit are also connected to said inner shell with the conduits on said inner shell being carried in, and movable with respect to, the conduits on said outer shell.

3,727,411

INFLUENCING SEDIMENTATION

Paul Cephas Rhodes, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 6, 1970, Ser. No. 87,420
Int. Cl. E02b *3/04*
U.S. Cl. 61—3 **7 Claims**



Means for influencing the sedimentation and movement of solid particles of material in seas, lakes and other bodies of water comprising an array of threads, tapes or filaments attached in loops to anchoring means.

3,727,412

PROCESS FOR THE IN SITU SEALING OF SOIL SURROUNDING UNDERGROUND CONDUIT BREAKS

John W. Marx, and Jr. Bowman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 16, 1971, Ser. No. 172,279
Int. Cl. E02d *3/12*
U.S. Cl. 61—36 R **14 Claims**

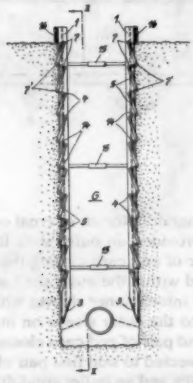
A process for sealing soil adjacent to underground conduit breaks through the use of surfactant-stabilized latex emulsion wherein the sealing phenomena can be made to occur at varying penetration depths therein forming a seal against fluid flow.

3,727,413

TRENCH SHORING, SHUTTERING AND SHEETING SYSTEM

Paul Christen, Chamerstrasse 18, Zug, Switzerland

Filed Aug. 10, 1971, Ser. No. 170,553
Claims priority, application Switzerland, Aug. 13, 1970, 12305/70
Int. Cl. E21d *5/12*
U.S. Cl. 61—41 A **6 Claims**



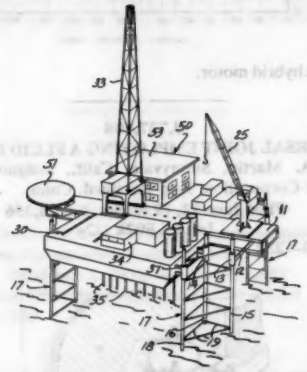
Trench shuttering system with a pair of upright posts spaced apart along opposite sides of a trench, and horizontally extending wall elements received between the posts and the trench wall. Each of the wall elements comprises a pair of parallel and relatively slidable members overlapping one another and releasably secured together by manually operable clamping means at the overlapping junction.

3,727,414

OFF SHORE DRILLING PLATFORM CONSTRUCTION

Philip Davies, Calgary, Alberta, Canada, assignor to Peter Bowden Drilling Services Ltd., Calgary, Alberta, Canada

Filed June 28, 1971, Ser. No. 157,545
Int. Cl. E02b *17/00*; B63b *35/44*
U.S. Cl. 61—46.5 **7 Claims**



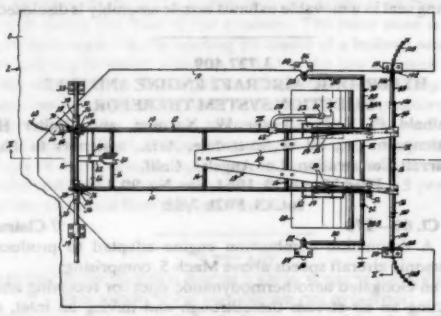
Four legs or spuds engaging the sea bed support an elevated, alongated platform above the water to form an I configuration defining a pair of barge-receiving slots into which different barges can be moved and raised to the platform level by jacking mechanisms. The arrangement permits "unit chassis" type operation by which first a drilling barge with a derrick can be introduced and then, after drilling, this barge can be removed and the slot occupied by a production barge, leaving a servicing slot vacant for future work.

3,727,415

BOAT DRY DOCKING DEVICE

Barney V. Williams, Route No. 1, Grove, Okla.

Filed Sept. 16, 1971, Ser. No. 180,976
Int. Cl. B63c *1/00*
U.S. Cl. 61—65 **7 Claims**



A boat dry docking device for small craft consisting of an elongated boat supporting frame adapted to be disposed longitudinally in the boat well of a floating dock and to be pivoted to said dock at the closed end of said well for vertical move-

ment, whereby the end thereof at the open end of the well may be dropped below water level, to receive a boat thereon, or raised to elevate said boat above water level, a flotation tank open at its bottom secured to the frame remotely from its pivot, mechanism operable to deliver air to or exhaust it from the tank whereby to raise or lower the frame, and reinforcing devices for preventing lateral tilting and lateral sidesway of the free end of the frame.

3,727,416

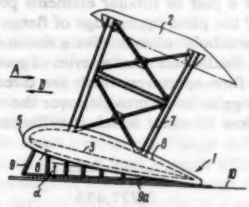
DEVICE FOR LAUNCHING SHIP FROM A SLIP

Arseny Alexandrovich Gaisenok, ulitsa Varshavskaya, 47, kv. 69; Yury Pavolovich Belyavin, Mytninskaya naberezhnaya, 7/5, kv. 40; Moisei Kalmanovich Glozman, Kanal Gribodedova, 124, kv. 33; Beris Vasilievich Mirokhim, 8 Sovetskaya ulitsa, 9/13, kv. 22; Emmanuil Albertovich Rakovsky, Krasnaya ulitsa, 20, kv. 116; Gennady Mikhailovich Chikov, 7, Sovetskaya ulitsa, 18/21, kv. 25; Valery Georgievich Maslovsky, prospekt Narodnogo Opolchenia, 159, kv. 112; Eugeny Natanovich Lushkov, ulitsa Frunze, 6, kv. 197, and Rix Rixovich Velsman, Degtyarny pereulok, 6, kv. 44, all of Leningrad, U.S.S.R.

Filed Aug. 25, 1971, Ser. No. 174,770

Int. Cl. B63c *3/00*

U.S. Cl. 61—67 **4 Claims**



A device for launching a ship from a slip comprising a hydrofoil mounted on a launching slide under the stern part of the ship and rigidly connected thereto through a system of rods.

The hydrofoil is mounted in such a way that its chord is parallel to the diametral plane of the ship while its nose is arranged in the direction of movement of the ship during its launching.

This hydrofoil develops a hydrodynamical lifting force which supports the stern part of the ship during the launching, thus reducing the reaction forces at the threshold of the slip.

3,727,417

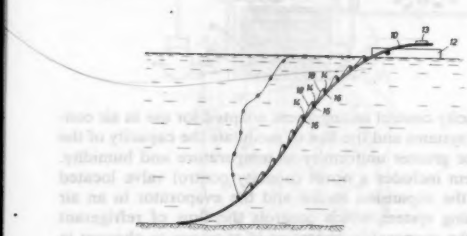
SUBMARINE PIPELINE LAYING APPARATUS

Clarence W. Shaw, Metairie, La., assignor to J. Ray McDermott & Co., Inc., New Orleans, La.

Filed July 23, 1971, Ser. No. 165,054

Int. Cl. F16l *1/00, 3/00*

U.S. Cl. 61—72.3 **41 Claims**



A system for laying a submarine pipeline using releasable floats at spaced points along the pipeline. Three recovery systems for the released floats are disclosed. According to a first system, the adjacent pairs of floats are linked together in a chain by cables so that, after recovery of the first released float, the remaining floats may be collected simply by pulling the cables. According to a second system, after release from the pipeline, each float is moored to the pipeline by an extensible cable that pays out under tension until the float reaches the surface; afterwards, a suitably equipped recovery vessel can pick up the floats which are disposed at the surface in a generally uniform pattern. According to a third system, each float is connected by a cable to a separate reel on a turntable on the lay vessel; after release of a float, a power chuck engages that floats associated reel and reels the float in on the cable. In the first system, the floats are collapsible bags, and a one-way valve is used to exhaust the air in the bag without admitting water. Two different means are disclosed for actuating release of the floats, one upon contact with the marine bottom and the other in response to a cable passing through releasable latches and connected to the ship.

3,727,418

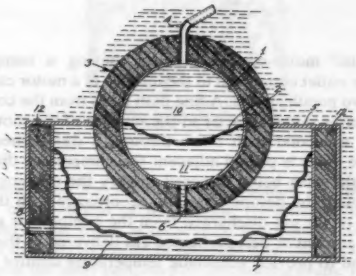
SUB-AQUEOUS STORAGE OF LIQUEFIED GASES

Frederick P. Glazier, Thornton, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed July 22, 1971, Ser. No. 165,234

Int. Cl. F17c *1/00*

U.S. Cl. 62—45 **11 Claims**



Liquefied natural gas is stored under water in a submerged, jacketed container the interior of which is coupled to a balancing fluid in another container, the balancing fluid being in turn coupled to the water surrounding both containers. The containers are fastened together, and the assembly is ballasted as appropriate, or required.

3,727,419

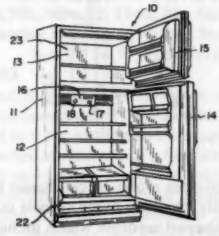
REFRIGERATOR CONTROL CIRCUIT

Ben W. Brightman, and Clarence C. Clarke, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 16, 1971, Ser. No. 153,562

Int. Cl. F25d *21/06*

U.S. Cl. 62—155 **11 Claims**



A refrigerator having a control thermostat disposed in the refrigerated chamber. The refrigerator control includes a

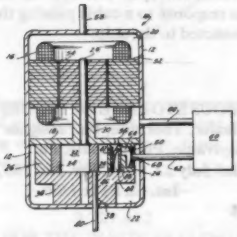
motor driven defrost timer. The motor of the timer is disposed in heat transfer association with the temperature responsive means of the thermostat. The thermostat and timer may be disposed in a space defined by a wall means forming a control console.

3,727,420

AUTOMATIC TEMPERATURE CONTROL FOR REFRIGERATION COMPRESSOR MOTOR

Milton M. Kosfeld, North Brunswick, N.J., assignor to Fedders Corporation, Edison, N.J.

Filed Oct. 4, 1971, Ser. No. 177,187
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 8 Claims



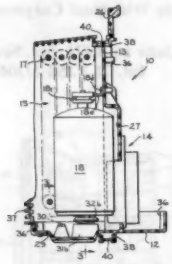
A sealed motor-compressor unit having a compressor discharge outlet connected to the interior of a motor casing by way of two parallel paths. A first path leads from the compressor discharge outlet directly to the interior of the motor casing, and a second path flows through a desuperheater. A bimetallic valve is placed adjacent the compressor discharge outlet, said valve being disposed to vary the opening to the path through the desuperheater in accordance with the temperature of the gas discharged from the compressor so as to vary the amount of desuperheated gas delivered to the motor casing and to provide automatic temperature control for the compressor motor.

3,727,421

ROOM AIR-CONDITIONER ONE-PIECE CHASSIS

David R. Berg, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sept. 3, 1971, Ser. No. 177,676
Int. Cl. F25d *23/12*
U.S. Cl. 62—262 1 Claim



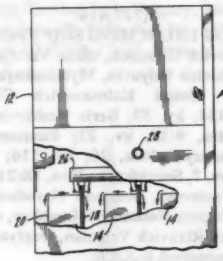
This invention provides a one-piece chassis for a room air-conditioner. Basically, this one-piece chassis comprises an inverted generally T-shaped member which includes a base portion and a barrier portion that is integrally formed with and extends generally upwardly from the base portion and divides the member into an indoor section and an outdoor section.

3,727,422

MEANS FOR WATER DEFROSTING OF REFRIGERATION PLATES

Joseph P. Apple, Jr., Arlington Heights, Ill., assignor to Dole Refrigerating Company, Chicago, Ill.

Filed Sept. 13, 1971, Ser. No. 179,937
Int. Cl. F25d *21/10*
U.S. Cl. 62—282 6 Claims



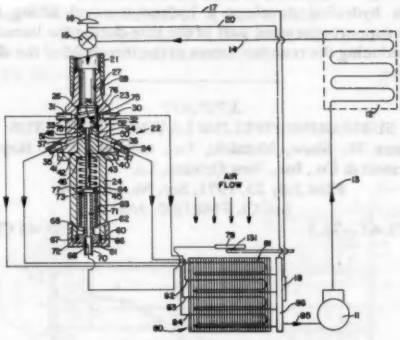
A water defrosting means for a plurality of refrigeration plates which is simply constructed, reliably operable and easily removed for cleaning. The defrosting means for each plate is made up of a pair of tubular elements positioned on opposite sides of the plate upper edge of flange. A header connects all of the tubular elements for a simultaneous supply of water thereto. Each header has a series of generally uniformly spaced water flow apertures which are directed toward the plate upper edge so as to provide, over the entire surface of the plate, a flow of water which is sufficient to defrost the plate sides.

3,727,423

TEMPERATURE RESPONSIVE CAPACITY CONTROL DEVICE

Gary E. Nielson, Florissant, Mo., assignor to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Division of Ser. No. 888,359, Dec. 29, 1969, Pat. No. 3,633,379. This application June 7, 1971, Ser. No. 150,416
Int. Cl. F25b *41/04*
U.S. Cl. 62—205 3 Claims



A capacity control arrangement adapted for use in air conditioning systems and the like to modulate the capacity of the system for greater uniformity in temperature and humidity. The system includes a novel capacity control valve located between the expansion means and the evaporator in an air conditioning system which controls the flow of refrigerant through the evaporator, operating in response to changes in temperature. As the temperature of the air approaches the set point, part of the passes through the evaporator are closed and, as a consequence, the remaining passes run colder for

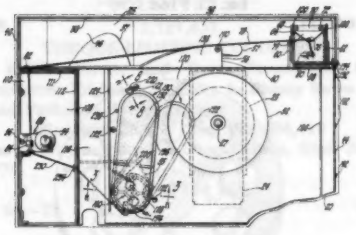
greater dehumidification. An artificial control means is provided whereby the capacity control valve may be remotely controlled independently of the actual temperature of the air flowing over the evaporator.

3,727,424

ROOM AIR CONDITIONER FRESH AIR INTAKE DUCT

William G. Edens; John H. Loos, both of Dayton, and Emerson L. Wark, Vandalia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed March 31, 9172, Ser. No. 239,954
Int. Cl. F25d *23/12*
U.S. Cl. 62—262 8 Claims



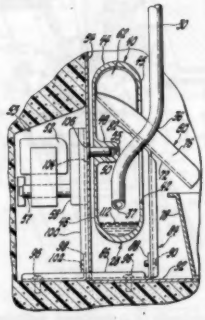
An elongated semi-cylindrical conduit damper rotatably supported about one end on the partition shround wall of a room air conditioner adjacent the evaporator centrifugal fan orifice with a fresh air opening in the wall aligned on one side of its axis of rotation. The conduit is biased to a first selected closed position in which a peripheral flange defining its elongated mouth is in continuous flush contact with the partition wall preventing passage of outside air through the wall opening. The conduit damper being rotatable to a second selected open position with its semi-spherical free end disposed in the path of the evaporator fan orifice so as to communicate a portion of its mouth therewith whereby the conduit provides an air flow passage connecting the suction side of the evaporator fan to the fresh air opening causing fresh air to be drawn through the conduit and the fan orifice for distribution to the room being conditioned.

3,727,425

ICE FLAKING MACHINE FOR DOMESTIC REFRIGERATORS

Keith K. Kesling, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1971, Ser. No. 193,367
Int. Cl. F25c *1/14*
U.S. Cl. 62—346 3 Claims



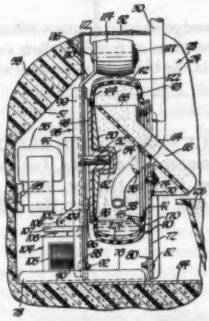
An automatic ice flaking machine for making fine ice or the like comprising a rotable drum which is rotated on a horizontal axis in the freezer compartment of a domestic refrigerator. Water is fed into the drum chamber during its rotation while freezing air is circulated over the drum to freeze the water in thin clear layers. An ice flake collecting trough extends through the drum side opening with the upper portion of the trough having an ice scraper located in close proximity to the inside surface of the drum chamber to scrape off ice from its inner periphery as the drum rotates delivering the flaked ice by gravity into a suitable ice storage container.

3,727,426

ICE MAKING DEVICE

Keith K. Kesling, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 28, 1971, Ser. No. 193,392
Int. Cl. F25c *1/10*
U.S. Cl. 62—346 6 Claims



An automatic ice piece making machine for use in the freezer compartment of a domestic refrigerator having an elastomer drum which is rotated on a horizontal axis while water is supplied to the drum chamber such that clear ice will form upon the inner periphery of the rotating drum. The drum is formed with inwardly directed transverse partitions such that its outer periphery and side wall regions form ice piece cavities allowing the ice pieces to be molded by the circulation of freezing air over successive films of water in the cavities. The ice pieces are automatically ejected from the drum by subjecting it to a load on its outer peripheral surface directed radially inwardly during the rotation of the drum causing the sides to be splayed laterally outwardly whereby the ice pieces fall by gravity onto a collecting chute and thence to a storage bin.

3,727,427

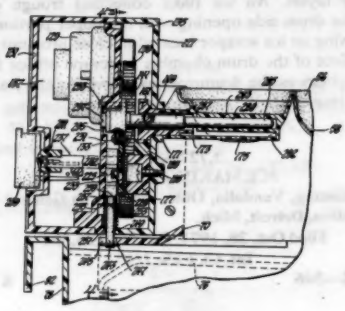
AUTOMATIC FREEZER

Charles W. Eyman, Jr.; Floyd O. Moody, both of Dayton, and Harold M. Snyder, Springfield, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 6,467, Jan. 28, 1970, which is a division of Ser. No. 774,786, Nov. 12, 1968, Pat. No. 3,540,227. This application Feb. 22, 1971, Ser. No. 117,650
Int. Cl. 74 *50*; F25c *1/10*
U.S. Cl. 62—353 1 Claim

In a preferred form an electric motor drives a large gear which operates a Scotch yoke type cam having an interrupted rack connected to it for turning an interrupted pinion which is operably connected to one end of a flexible mold for inverting and twisting the mold about the axis of a double throw hydraulic thermostat switch. A commutator is provided on the large gear. Cooperating with this commutator and thermostat are spring contacts controlling the filling, freezing and ejection periods. One of these commutator contacts is pivoted into and out of contact with a wedge shaped contact by the movable bin carrier under the control of a weak and stronger spring ar-

rangement to stop the operation whenever the bin is removed or when it is filled to a measured amount. A manual adjust-



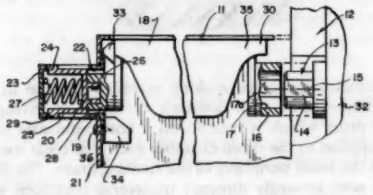
ment moves this wedge shaped contact relative to this pivoted contact to vary the mass of frozen pellets or ice cubes which may be deposited in the bin before the operation is stopped.

3,727,428

TWIST TRAY ICE MAKER WITH REMOVABLE TRAY

William J. Linstromberg, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 12, 1971, Ser. No. 171,188
Int. Cl. F25c *1/10*
U.S. Cl. 62—300 10 Claims



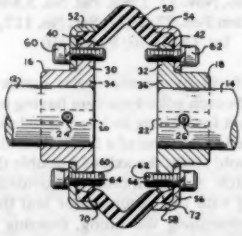
An ice maker in which ice bodies are formed in a tray from which the formed ice bodies are harvested by a twisting action. Means are provided for releasably mounting the tray in the apparatus for facilitated disconnection without the use of tools such as for maintenance of the tray.

3,727,429

SHAFT COUPLING

Holmes Downey, Bremen, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Continuation-in-part of Ser. No. 40,751, May 27, 1970, abandoned. This application June 10, 1971, Ser. No. 151,848
Int. Cl. F16d *3/58*
U.S. Cl. 64—11 R 14 Claims



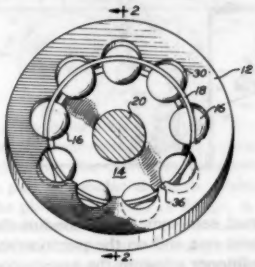
A shaft coupling in which two spaced flanges are mounted on shafts positioned in end to end relation and a torsional element of elastomeric material and of a generally V-shaped cross sectional configuration with axially extending margins is secured to said flanges. The flanges are provided with an annular peripheral surface tapered with an increasing diameter towards the inner side of the flange, and clamping rings secured to the flanges by a plurality of screws and having an axially extending annular portion clamping the margins of the torsional element onto the tapered surfaces.

3,727,430

CONSTANT VELOCITY UNIVERSAL JOINT

Robert T. Eddy, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed May 24, 1971, Ser. No. 146,071
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 9 Claims



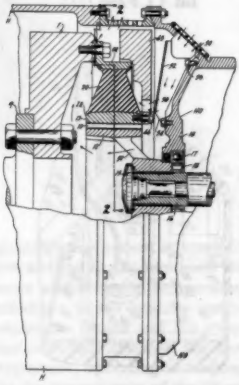
A constant velocity, axially adjustable, universal joint having an outer race with straight, axially parallel grooves on its inner surface, and an inner race with straight, axially parallel grooves on its outer surface, balls seated in said grooves forming driving elements between the two races, and a retainer spaced from said inner race for retaining said balls in their respective grooves. The joint is designed primarily for use in a multiple cylinder pump or motor or hydrostatic transmission in which the outer race or the supporting structure therefor forms a wobble plate for driving pistons in the cylinders.

3,727,431

FLEXIBLE TORSIONAL COUPLING

Edward C. Yokel, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Oct. 12, 1971, Ser. No. 188,200
Int. Cl. B16d *3/10*
U.S. Cl. 64—27 NM 16 Claims



A coupling for transmitting power in a transmission or the like, and having an inner and outer member concentrically

located together and furthermore having a flexible material such as rubber bonded between and connecting the inner and outer members. The flexible material forms a torsional connecting member which can act in shear to absorb torsional fluctuations between the two members and transmit normal driving torque between the members. In addition to the flexible material connecting the two members, interengagable means are provided between the two members which can form a mechanical drive in the event that the torque between the members exceeds a predetermined amount. Normally, the mechanical connection is not engaged but comes into play only when the rubber material deflects in shear beyond a predetermined amount due to excessive torque between the members.

3,727,432

TORQUE-LIMITING CLUTCHES

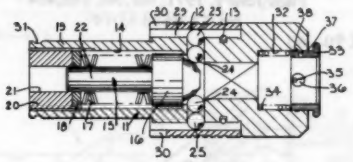
Dennis Robert Eaves, and Horst Bergemann, both of Christchurch, England, assignors to Bishop Eaves & Sons Limited, Parkstone, Poole, England

Filed Sept. 28, 1971, Ser. No. 184,410

Claims priority, application Great Britain, Sept. 30, 1970, 46,451/70

Int. Cl. F16d *7/06*

U.S. Cl. 64—29 **7 Claims**



A torque-limiting clutch includes an inner member formed with four radial passages each containing a pair of balls. The radially outermost ball of each pair normally seats in a groove in an outer member surrounding the inner member and the radially innermost ball of each pair engages a generally conical surface of the head of a spindle contained in a bore in the inner member and acted on by a spring so as to urge the balls radially outwardly. Under torque overload conditions the balls move radially inwardly to move the spindle against the action of its spring.

3,727,433

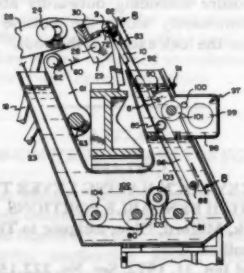
METHOD AND APPARATUS FOR WARP KNITTING HOOK AND LOOP FASTENERS

Hisashi Hamano, Soka, Japan, assignor to International Knitlok Corporation, New York, N.Y.

Filed Nov. 17, 1970, Ser. No. 90,415

Int. Cl. D04b *23/06*

U.S. Cl. 66—84 **12 Claims**



Novel warp knitting apparatus is disclosed for producing a knitted pile fabric suitable for use in a hook and loop fastener. In conjunction therewith, means are disclosed for heat setting the pile and for cutting pile loops to form hooks.

3,727,434

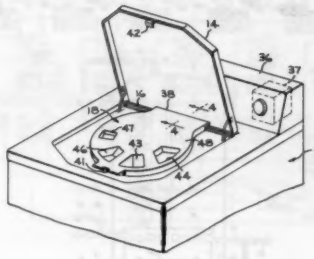
ADDITIVE DISPENSING SYSTEM

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 10, 1971, Ser. No. 170,601

Int. Cl. D06f *39/02*

U.S. Cl. 68—17 R **4 Claims**



A system for sequentially dispensing a plurality of treating agents into the wash tub of an automatic fabric washing machine at predetermined times during the washing cycle. The dispenser is hingedly mounted above the wash tub and so located that in its operative position a liquid supply means is in cooperative relationship with a plurality of liquid inlets in the dispenser. Additives to be dispensed are placed selectively by the housewife into appropriate compartments in the dispenser and are flushed therefrom by sequentially controlling the liquid supply means to direct liquid into preselected ones of the liquid inlets and appropriate compartments at predetermined times in the washing cycle of the automatic washing machine.

3,727,435

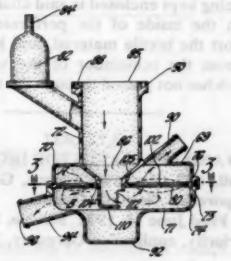
SELF-CLEANING LINT FILTER FOR A RECIRCULATING CLOTHES WASHER

Melvin A. Menk, Dayton, Ohio, assignor to General Motor Corporation, Detroit, Mich.

Filed Dec. 27, 1971, Ser. No. 211,973

Int. Cl. D06f *39/10;* **B01d** *35/22*

U.S. Cl. 68—18 F **5 Claims**



A self-cleaning lint filter for a domestic clothes washer is connected between a water container and a pair of reversible pumps. The lint filter includes a circular filter screen with an off-center hole therein. A nozzle receiving water from the water container projects through the hole. When one pump operates, lint is entrapped on one side of the screen. When the other pump operates, the nozzle due to its off-center location effects a swirling turbulence adjacent the same side of the screen to flush the entrapped lint therefrom. The filter screen is loosely fit to flex back and forth as an aid in dislodging entrapped lint.

3,727,436

DEVICE FOR THE WET TREATMENT OF PACKED AND SIMILAR TEXTILE MATERIALS

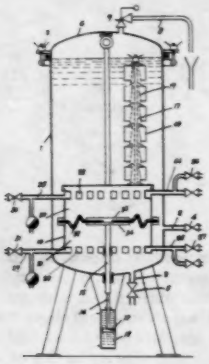
Maria Teresa Clermont Vinas, Paseo Can Feu, 68/80, Sabadell, Spain

Filed June 17, 1971, Ser. No. 153,945

Claims priority, application Switzerland, June 24, 1970, 9552/70

Int. Cl. B05c *8/02*

U.S. Cl. 68—189 **11 Claims**



Device for the wet treatment of packed and similar textile materials, comprising a hermetically locked enclosure, containing the treatment bath for the material, and the interior of which is divided into two chambers. One of these chambers communicates with the interior of the perforated cores which carry the packed material to be treated and their perforated tubular supports and the other chamber communicates with the outside of these cores. Both these chambers are separated by a volumetric alternating treatment bath impelling mechanism, this mechanism is of a type made up of a piston, a membrane pump or rotating pump. Said alternating treatment bath impelling mechanism impels, during every one of its to and fro strokes a part of the treatment bath and compels it to pass through the textile material or, respectively, from the inside of same towards the outside and from the outside towards the inside. The treatment bath volume which each time flows through the textile matter from the outside towards the inside of same is being kept enclosed in said chamber which communicates with the inside of the perforated tubular supports which support the textile material, and is at same time kept separated from the remainder of the total treatment bath volume which has not passed through the textile matter.

3,727,437

METHOD AND APPARATUS FOR IRONING LEATHER

Jirl Dokoupil, 637 Oberursel/Taunus, Germany, assignor to USM Corporation, Boston, Mass.

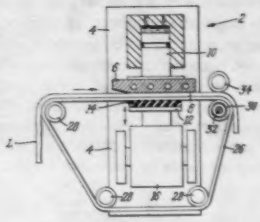
Filed June 14, 1971, Ser. No. 152,663

Claims priority, application Germany, June 15, 1970, P 20 29 405.7

Int. Cl. C14b *1/30*

U.S. Cl. 69—48 **10 Claims**

A throughfeed ironing machine and the method of ironing leather sheets therein. The ironing apparatus includes a heated ironing plate disposed on one side of a pass line extending through the machine, along which an ironed leather sheet travels. An oscillatable pressure plate is disposed opposite the ironing plate on the other side of the pass line, and an endless belt is disposed between said plates and aligned with the pass line in the plate area to transport the leather to be ironed through said machine. In the practice of the method, leather sheets are fed through the machine between the plates, being heated and cyclically pressed therebetween, and advanced during the intervals of pressure rise and falls between the plates. In the method, the pressure plate is oscillated at a



frequency of from 5 to 50 cycles per second, with the ironed leather being advanced on the rise and fall thereof, thereby giving the quality of a hand ironed finish to the leather.

3,727,438

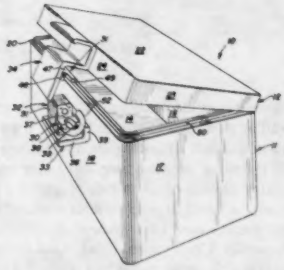
PADLOCK PROTECTION SYSTEM

Howard L. Knaack, McHenry, Ill., assignor to Knaack Manufacturing Company, Crystal Lake, Ill.

Filed June 1, 1971, Ser. No. 148,454

Int. Cl. B65d *55/14*

U.S. Cl. 70—63 **7 Claims**



A tool box adapted to be locked shut by a padlock, including a main box portion, a retractable closure, a first lock bracket on the front wall of the main box portion, a second lock bracket on the closure, said lock brackets being of similar U shapes disposed in overlying relation when the box is closed so that the base of the U shapes is adapted to abut a padlock body and the bight between the legs of the U's receives the lock shackle to prevent insertion of a prying tool when the lock is latched, a first lock cover on the main box portion extending outwardly below the lock brackets, and a second lock cover on the closure extending outwardly above the lock brackets and downwardly along the outside of the lock brackets to enclose the lock except at the ends.

3,727,439

MODULAR KEY LOCK HAVING LEVER TUMBLERS WITH BENDABLE PORTIONS

Joseph J. Parrock, Milford, Ohio, assignor to The Mosler Safe Company, Hamilton, Ohio

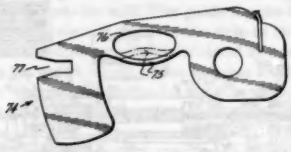
Filed Jan. 31, 1972, Ser. No. 222,153

Int. Cl. E05b *25/00*

U.S. Cl. 70—355 **15 Claims**

A key lock which can be produced in modular form with standardized tumblers. The tumblers are levers which have

bendable or deformable portions, and are fitted to a particular cut key by inserting the key into the lock and turning it while the tumblers are held against turning in predetermined posi-



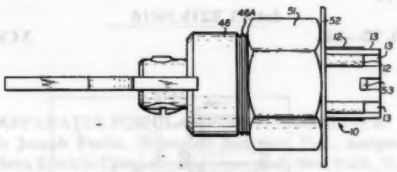
tion. This displaces the bendable portions of the tumblers to new positions corresponding to the respective lift heights of the key which is used to carry out the bending.

3,727,440

TUMBLER LOCK CODE PIN AND KEY CODING SET AND METHOD OF CODING A LOCK AND COMPLEMENTARY KEY

Harry Greenwald, Whitestone, and Christos Lambiris, Bronx, both of N.Y., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed June 14, 1971, Ser. No. 152,671
Int. Cl. E05b *19/18*
U.S. Cl. 70—411 **6 Claims**



This disclosure is directed to a method of coding a tumbler lock and key adapted therefor, and to a tumbler lock code pin the key coding set. The coding set comprises a support for holding a tumbler lock to permit ready access to the code pins. Identifying indicia are located on the support to identify the respective positions of each lock code pin. A key adapted to fit the keyway of the lock is formed with a series of complementary flutes, each being adapted to receive a similarly constructed key blade. An identifying member is removably positioned on the key to identify the complementary, corresponding key flutes adapted to receive the respective code pins of the lock. A gage is provided to effect the adjustment of the "set-back" distance of the respective key blades within their respective key flutes. The gage includes a series of selective gaging edges to effect displacement or adjustment of the respective key blades in the "set-back" position a distance equal to the displacement of the complementary code pin necessary to effect the operation of the lock. A locking collar located in the key is then tightened to maintain the key blades in their respective "set" or coded position

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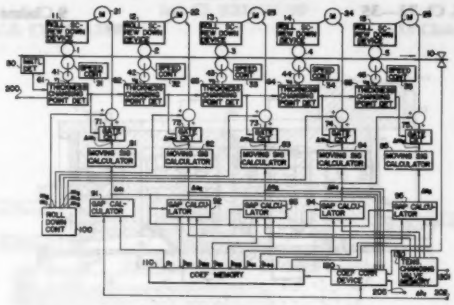
3,727,441

THICKNESS CONTROL APPARATUS FOR ROLLING MILL

Yasuo Morooka; Masaya Tanuma, and Mikihiko Onari, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed March 16, 1971, Ser. No. 124,846
Claims priority, application Japan, March 16, 1970, 45/21512
Int. Cl. B21b *37/14*
U.S. Cl. 72—6 **19 Claims**

A thickness control apparatus for a rolling mill in which the output thickness of a moving web or strip is changed by changing the set value of the thickness of the rolling material from a specific point, and said thickness control apparatus is characterized in that the thickness of the rolling material is changed at the first stand, and the tension of the web or strip is controlled in the rest of the stands.

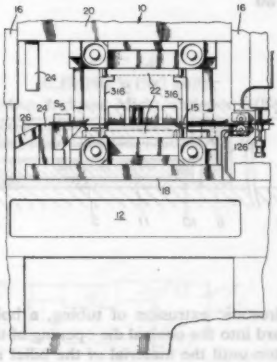


3,727,442

AUTOMATIC STAMPING PRESS ARRANGEMENT AND METHOD OF OPERATION

Merrill L. Ridgway, Minster; Robert M. Carabbio; Robert D. Jordan, both of St. Marys; Donald N. Seyfried, New Bremen, and Philip V. Monnin, Minster, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Filed Sept. 21, 1970, Ser. No. 73,702
Int. Cl. B21j *9/10*
U.S. Cl. 72—7 **38 Claims**

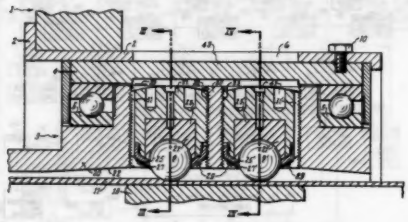


The specification discloses an automated stamping press arrangement in which die sets are carried in a first storage unit from which unit the die sets can be selectively inserted into and removed from the stamping press. A second storage and handling unit carrying supplies of strip stock is provided adjacent the press and selectively presents a coil of strip stock to serve as the raw material from which stamped parts are manufactured. The feeding of the strip stock is controlled in conformity with the amount required on each stroke of the press for the respective die set in the press, and the number of press cycles is controlled to provide for a desired number of workpieces from a respective die set. A control system is provided utilizing, for example, a punched card which programs the operation of the press with respect to die selection, stock selection, press adjustments and feeding of the stock.

3,727,443
BALL SWAGE FOR REDUCING TUBES

Frank B. Quinlan, 1947 Hetrik Avenue, Richland, Wash.

Filed April 23, 1971, Ser. No. 136,791
Int. Cl. B21c 3/08
U.S. Cl. 72—35 9 Claims

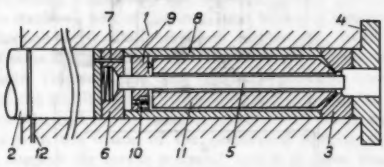


A device for reducing tubes. Two annular sets of balls are axially spaced in a revolving drawing head and successively engage a tube as it is drawn through the head. The number of balls in one ring is different from that in the other, thereby smoothing out any helical grooves and ridges formed by the first set. The balls are individually mounted in sockets in threaded slugs carrying micrometer markings.

3,727,444
PRESS FOR HYDROSTATIC EXTRUSION OF TUBING

Jan Nilsson, Robertsford, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed March 1, 1972, Ser. No. 230,726
Claims priority, application Sweden, March 15, 1971, 3280/71
Int. Cl. B21c 23/08
U.S. Cl. 72—60 2 Claims



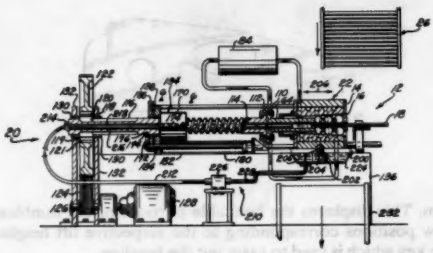
In the hydrostatic extrusion of tubing, a hollow billet is pressed forward into the conical die opening of the press by a following piston until the material of the billet is pressed inwardly against the mandrel and is shaped to the conical surface of the die, after which pressure fluid is admitted around the billet for hydrostatic extrusion.

3,727,445
METHOD AND APPATATUS FOR FORMING A BLANK

Martin Robert Baginski, Ashtabula, Ohio, assignor to Ashtabula Bow Socket Company, Ashtabula, Ohio

Filed Aug. 24, 1970, Ser. No. 66,229
Int. Cl. B21c 37/18
U.S. Cl. 72—75 2 Claims

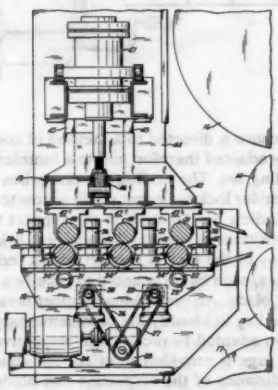
In a method and apparatus for forming a blank into an article, the blank is supported by suitable means. A blank deforming means is rotatable about the longitudinal axis of the blank and is movable axially relative thereto. A contour means cooperates with the deforming means as the deforming means moves along the longitudinal axis of the blank and controls the deforming means. The contour means comprises a cam surface along which the deforming means moves and which controls the position of the deforming means relative to the blank and thus controls the shape of the article formed by the deforming means.



3,727,446
ENTRY GUIDE FOR ROLLING MILLS

Charles Storer Shumaker, Glenshaw, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.

Filed Nov. 12, 1970, Ser. No. 88,789
Claims priority, application Great Britain, Jan. 12, 1970, 1,435/70
Int. Cl. B21b 39/16
U.S. Cl. 72—161 3 Claims



The present disclosure relates to an entry guide for a rolling mill and, more particularly, to such guides used in connection with a tandem cold strip reduction mill. The disclosed guide comprises a pair of spaced-apart lower frames carried by parallel guide rods wherein the frames are movable transversely along the rods towards and away from the edges of the strip. The frame rotatably carries a lower set of spaced-apart transversely extending horizontal parallel rollers which are so mounted that the frames are allowed to move relative to the horizontal rollers. The frames also carry vertically arranged opposed strip side guiding rolls which are interspaced between the horizontal rollers. These rolls are mounted so as to move with the frames. An upper frame is provided for rotatably supporting an upper set of spaced-apart horizontal rollers, one for each roller of the lower set, which are adapted to be brought into a working relationship with the lower horizontal rollers in a manner that one roller of each cooperative pair assumes an offset relationship with the other roller of the same cooperative pair.

It is customary in operating tandem cold rolling mills for ferrous and non-ferrous metals to provide various forms of entry guides or stickers that assist in entering the leading end of the strip into the bite of the mill. The entry guides also guide the strip during feeding thereof in addition to serving to flatten the strip as it enters into the mill. The guide for the first stand of a tandem cold mill, since it receives the strip as immediately unwound from a coil, is usually maintained in contact with the strip during the entire length of the coil due to the non-flatness of the strip; whereas the guides for the other succeeding stands are usually opened up after the leading end is fed into the stand.

Accordingly, it has been the practice to provide a strip entry guide and particularly for the first stand of a tandem cold strip mill comprising spaced-apart sets of upper and lower horizontal, non-driven rollers wherein the rollers of each set are arranged in the same vertical plane. Between the horizontal set there is usually provided vertical non-driven guide rollers for restraining and guiding the opposite edges of the strip passing to the mill. The horizontal rollers are brought into engagement with the strip, usually after the leading end had entered the mill, for the purpose of flattening the strip by a pinching action. It was found, however, that not only was this arrangement ineffective to properly flatten the strip, but that the pinching action may create a marking on the strip which was highly objectionable. As noted previously, it is customary to maintain the rollers in engagement with the strip during the uncoiling of the entire coil so that the entire length of the strip may be marked.

3,727,447

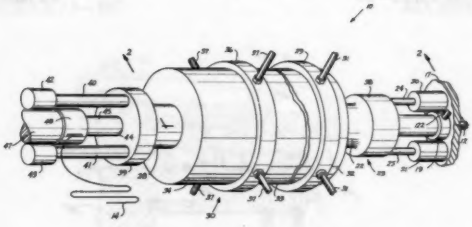
APPARATUS FOR CLAMPING A WORKPIECE

Francis Joseph Fuchs, Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 862,673, Oct. 1, 1969, Pat. No. 3,696,652. This application May 3, 1971, Ser. No. 139,974

Int. Cl. B21d *23/08*

U.S. Cl. 72—270 **4 Claims**



An apparatus wherein a workpiece of indefinite length, e.g., a metal rod, is continuously deformed by a deforming agency to produce a product of indefinite length, e.g., wire. The continuity of the deformation is achieved by intermittently advancing the workpiece into the deforming agency, e.g., a controlled flow of pressurized fluid or a conventional extrusion die, intermittently advancing the deforming agency over the workpiece, and controlling the intermittent advances of the workpiece and the deforming agency to maintain a desired relative velocity between the workpiece and the deforming agency. Also disclosed is a novel workpiece clamping apparatus wherein a segmented cylinder is used as a clamping device for gripping a workpiece.

3,727,448

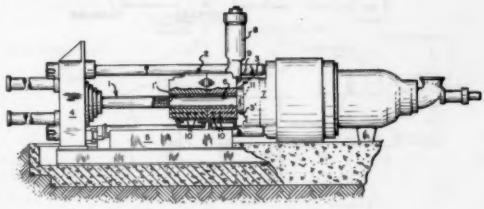
INDIRECT EXTRUSION

Alfred W. Mann, Rockwall, Tex., assignor to Texas Aluminum Company, Inc., Rockwall, Tex.

Filed Jan. 20, 1971, Ser. No. 108,132

Int. Cl. B21c *23/00*

U.S. Cl. 72—255 **15 Claims**



An improved gag member for an indirect extrusion apparatus wherein a billet material is held within an open ended container with a die at one end of the container and the gag member at the other end; the gag member being used to move the container over the die and the billet material through the die. The improved gag member has a front face engaging the end of the container; and a cavity is formed in the front face in alignment with the bore of the container. In an extrusion operation, billet material is held in the cavity of the gag member and the entire amount of material held in the container is extruded through the die member.

3,727,449

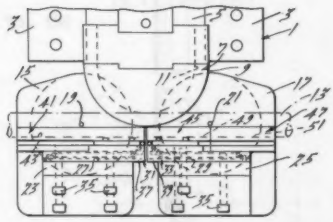
SLIDING WING DIES

James H. Johnston, Jackson, Mich., assignor to Tenneco Inc., Racine, Wis.

Filed Nov. 18, 1970, Ser. No. 90,497

Int. Cl. B21d *7/00*

U.S. Cl. 72—389 **4 Claims**

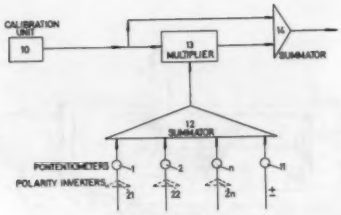


A vertical press tube bender has wing dies which are mounted on wing die supports for relative movement with respect to the supports so that the wing die position is controlled by movement of the tube during bending.

3,727,450
GAS COMPOSITION ANALYSIS

John Luckers, Liege, Belgium, assignor to Centre National de Recherches Metallurgiques, Brussels, Belgium

Filed Jan. 28, 1971, Ser. No. 110,633
Claims priority, application Belgium, Jan. 28, 1970, 745109
Int. Cl. G01n 21/00; G01d 3/02
U.S. Cl. 73—23 12 Claims



Gas analysis apparatus comprising gas analyzers and calibration units, each having a variable characteristic, is adjusted by two steps. Firstly, the characteristics of the calibration units are modified to correct the analyzer output signals so as to compensate for drift in the analyzers. The modification of each unit is by independent zero and gain corrections. Secondly, the output signal of each unit is corrected according to the relation:

$$C_x - C'_x = f(C_1, C_2, \ldots C_n, C_x),$$

where C_x is the true concentration of the gas detected by the x^{th} analyzer, C'_x is the concentration represented by the calibration unit output, $C_1 \ldots C_n$ are the true concentrations of the other gases, and f is a mathematical function.

3,727,451
METHODS OF MAKING AND USING A CHROMATOGRAPHIC COLUMN COMPRISING A FLEXIBLE YARN AS THE SOLID SUPPORT

Arthur B. Broerman, Bartlesville, Okla., assignor to Phillips Petroleum Company

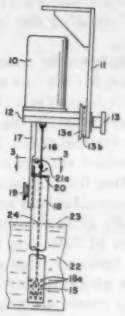
Filed Feb. 12, 1968, Ser. No. 704,702
Int. Cl. G01n 31/08; B01d 15/08
U.S. Cl. 73—23.1 2 Claims

A chromatographic column is manufactured by passing a guide member such as a needle or wire through a tubing of small diameter. The end of the guide member is secured to a continuous yarn, and the guide member is withdrawn to pull the yarn into the tubing. The yarn can be coated with a partitioning liquid. Various types of yarns, synthetic or natural, can be employed.

3,727,452
VAPOR GUARD VISCOMETER

Nazar P. Kenyon, Birmingham, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Aug. 5, 1971, Ser. No. 169,309
Int. Cl. G01n 11/14
U.S. Cl. 73—59 6 Claims

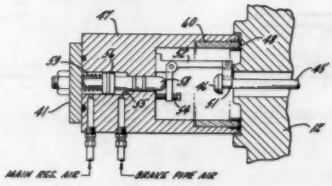


Viscometer means are provided for monitoring, over extended periods, the viscosity of pharmaceutical capsule dipping solutions and the like, particularly solutions being mixed under exposure to air. The apparatus includes a rotational viscometer and viscometer spindle having guard means affording non-turbulent exposure to the moving liquid and protection for critical shear surfaces.

3,727,453
APPARATUS FOR TESTING AIR BRAKE CONTROL VALVES

James G. Rees, Hammond, Ind., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Continuation-in-part of Ser. No. 821,801, May 5, 1969, Pat. No. 3,596,500. This application Aug. 3, 1971, Ser. No. 168,547
Int. Cl. G01m 3/26
U.S. Cl. 73—39 4 Claims

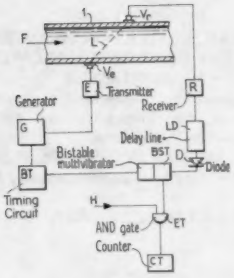


Apparatus is provided for testing air brake valve portions. The apparatus features a fluid operated brake clamp to confine the air brake control valve portion by applying sealing pressure to the air brake portion from a pivotable C-clamp which is free to move longitudinally with respect to the air brake portion. In addition, the apparatus includes a device for confining and locating the air brake control via a controlable piston stop contained within a sealed chamber. Several air control valves in the test apparatus are activated automatically, and substantially the entire test program is conducted on automatic control.

3,727,454
ULTRASONIC SYSTEMS FOR CARRYING OUT FLOW MEASUREMENTS IN FLUIDS

Albert Courty, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 19, 1971, Ser. No. 116,880
Claims priority, application France, Feb. 27, 1970, 7007189
Int. Cl. G01f *1/00*; G01p *5/00*
U.S. Cl. 73—194 A **5 Claims**



An ultrasonic system for carrying out flowrate measurement in fluids comprises a generator transmitting a frequency modulated wave signal. This signal is converted into an ultrasonic signal by a first transducer. A second transducer, after propagation across the fluid receives this signal, and converts this into a delayed electric wave train.

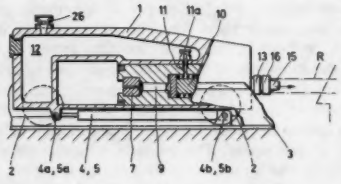
This wave train delivered to a dispersive delay line is transformed therein into a train of very short duration.

This latter signal after detection, allows accurate determination of the propagation time across the fluid.

3,727,455
IMPULSE TRANSMITTER FOR DYNAMIC DEVICES FOR TESTING PIECES OF ORDNANCE

Dieter Boder, Dusseldorf-Oberkassel, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Nov. 3, 1971, Ser. No. 195,302
Claims priority, application Germany, Dec. 5, 1970, P 20 59 956.8
Int. Cl. G01m *7/00*; F41f *25/00*
U.S. Cl. 73—167 **22 Claims**

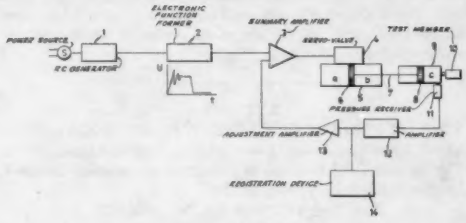


An impulse transmitter for dynamic devices for testing pieces of ordnance to simulate the recoil of the piece without actual firing. The impulse transmitter includes a housing having a cylinder receiving a propellent charge and the rear portion of a piston, the forward portion of the piston extending from the housing for abutment against the barrel of the piece of ordnance. The cylinder is provided with apertures which open into a chamber formed in the housing which has a volume greater than the volume of the cylinder through which the piston moves during the working stroke. The chamber is provided with a venting valve for venting the chamber to the atmosphere such that when the propellent charge is ignited, the gases formed thereby cause forward movement of the piston against the barrel with the firing report being intensively damped such that the gases flow from the cylinder into the atmosphere with only a hissing sound.

3,727,456
APPARATUS FOR THE STRENGTH-AND LIFE-TEST OF HYDRAULIC STRUCTURAL ELEMENTS

Helmut Gruneberg, Bremen, Germany, assignor to Aviatest GmbH, Dusseldorf, Germany

Filed Feb. 2, 1971, Ser. No. 111,878
Claims priority, application Germany, Feb. 11, 1970, P 20 06 092.8
Int. Cl. G01m *19/00*
U.S. Cl. 73—168 **4 Claims**

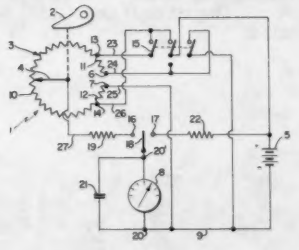


An apparatus for the strength- and life-test of hydraulic structural elements which comprises a pulse generator which produces periodically a pressure-time curve. An electro-hydraulic servo-valve is provided. A pressure device follows the servo-valve. A nominal-actual-value-comparison circuit is arranged and the pulse generator operates the pressure device, whereby the latter is adapted to transmit the produced pressure to a testing member, and to readjust the same simultaneously by means of the nominal-actual-value-comparison circuit automatically. A function generator is provided which comprises a rectangle wave signal generator producing a low electric voltage with low frequency and a function transformer following the generator. The function transformer produces an impulse corresponding with a dampening sinus function by feeding an inpulse from the rectangle wave signal generator. The impulse produced by the function transformer is fed as nominal value to the servo-valve. A pressure device follows the servo-valve and affects a member to be tested, and a pressure receiver receives equal pressure from the pressure device, whereby the pressure measured on the pressure receiver is transformed into an electric impulse and is returned as actual value into the servo-valve.

3,727,457
APPARENT WIND INDICATOR

Nicholas Gregory, 40 Haggetts Pond Road, Andover, Mass.

Filed Jan. 21, 1969, Ser. No. 792,246
Int. Cl. G01w *1/00*
U.S. Cl. 73—188 **11 Claims**



An apparent wind indicator for indicating the wind direction relative to a moving sailboat. The indicator shows relative wind direction for both downwind and tacking maneuvers of the boat. The readout unit of the indicator provides

one-for-one correspondence between incremental changes of direction for downwind travel and a much greater incremental change in readout for a given change in wind direction during tacking. The indicator employs a circular-track potentiometer disposed at the top of the mast of the boat and the readout unit is at deck level. In one embodiment the change in incremental readout as a function of wind direction changes for tacking is effected by shorting out a major portion of the track leaving two minor portions which are tied together to allow both starboard and port tacks to be read over a large part of the readout scale (i.e., the order of 330°). In another embodiment a plurality of differential amplifiers is used to effect the same result. The apparatus is adapted to be combined with other boat devices such as, for example, velocity recording apparatus, to give combined indications.

3,727,458

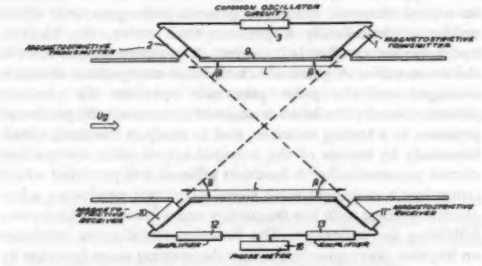
MEASUREMENT OF RATES OF FLOW OF GASES

Michael John Parkinson, Leatherhead, England, assignor to The British Coal Utilisation Research Association Limited, Leatherhead, Surrey, England

Filed Dec. 12, 1969, Ser. No. 884,487

Int. Cl. G01f 1/00; G01p 5/00

U.S. Cl. 73—194 A **29 Claims**



A method and apparatus are described which enable the rate of flow of gas in a tube to be measured accurately. The invention uses two sources of acoustic signals to propagate upstream and downstream respectively across the gas flow. The signals are picked up by receivers and the phase difference measured to give an indication of velocity of the gas. A correction factor is added by measuring a third signal propagated perpendicular to the gas flow over varying distances across the tube. The correction factor takes account of changes in the gas composition affecting the molecular weight of the gas.

3,727,459

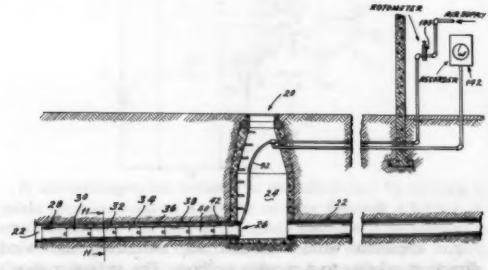
MEANS FOR ACCURATELY MEASURING AND MONITORING LIQUID FLOWS

Carl F. Buettner, 9501 Pine Spray Court, Crestwood, Mo.

Filed Jan. 12, 1972, Ser. No. 217,376

Int. Cl. G01f 1/00

U.S. Cl. 73—205 R **12 Claims**



Apparatus for measuring and monitoring liquid flows including particularly waste water flows by a novel multi-sectioned flow tube which is constructed and adapted to be installed in existing conduits or channels such as in a sewer main or the like, which apparatus provides means for obtaining continuous data from which the quantity of flow can be accurately and inexpensively determined for some purpose.

3,727,460

AUTOMATIC DEVICE FOR MEASURING THE TEMPERATURE OF A MEDIUM FLOWING FROM A CONTAINER

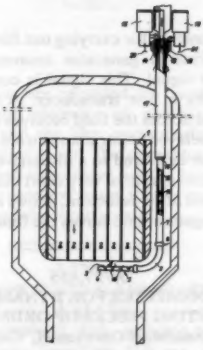
Willi Francioni, Lauffohr, Switzerland, assignor to Gesellschaft Zur Forderung der Forschung an der Eidg Techn. Hochschule, Zurich, Switzerland

Filed May 15, 1970, Ser. No. 37,804

Claims priority, application Switzerland, May 20, 1969, 7651/69

Int. Cl. G01k 1/14; G21c 17/00

U.S. Cl. 73—343 R **10 Claims**



An automatic temperature measuring device for measuring the temperature of a medium which flows out from a plurality of separate inner chambers through the end thereof, which inner chambers extend in a container axially parallel to its longitudinal axis. A temperature feeler is movable outside the container in a plane perpendicular to the container axis and can be positioned in front of each end opening of each inner chamber. The temperature feeler is arranged on a link chain which can be bent in only one direction from the extended position, the members of which link chain due to gravity support one another to form a straight arm positioned in the mentioned plane of movement. A guide extends laterally of the container and axially parallel to same and is bent to point into the plane of movement. The guide is rotatable about its axis and the chain can be driven in and out of the guide whereby the temperature feeler is movable in the plane in any circular arc or radius.

3,727,461

DISPOSABLE PLASTIC THERMOMETER

Josef F. Klingler, Wilmette, Ill., assignor to Thermex, Inc., Chicago, Ill.

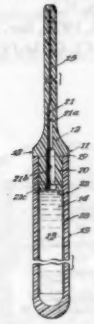
Continuation of Ser. No. 872,855, Oct. 31, 1969, abandoned. This application Dec. 2, 1971, Ser. No. 204,335

Int. Cl. G01k 5/08, 1/16

U.S. Cl. 73—371 **23 Claims**

A low cost clinical thermometer formed primarily of molded plastic permitting one-time use thereof. The thermometer includes a tubular capillary portion and a bulb portion sealingly secured to the capillary portion. A metal sleeve is provided within the bulb portion for maintaining dimen-

sional stability thereof and for maintaining the temperature of the liquid during readout of the thermometer. The capillary



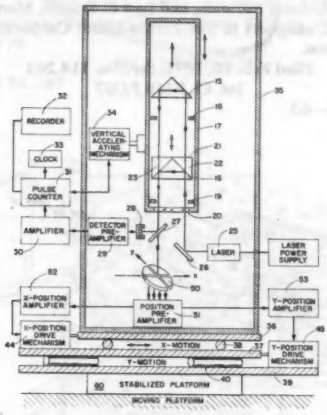
portion is defined by a capillary bore having an improved stepped end opening to the reservoir chamber of the bulb portion.

3,727,462

MOTION STABILIZED GRAVITY GRADIOMETER

Richard S. Stone, Lexington; Donald L. Sullivan, Concord, and Peter C. Von Thuna, Lexington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Aug. 7, 1970, Ser. No. 62,110
Int. Cl. G01v 7/14
U.S. Cl. 73—382 **9 Claims**



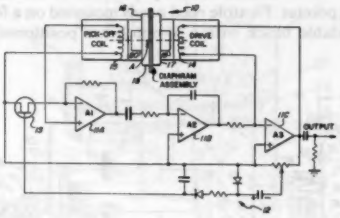
Method and apparatus for measuring gravity gradients directly. Two retroreflectors are caused to experience free flight, and the radiation reflected by these retroreflectors during free flight is directed to a radiation receiver which senses and measures the temporal variations of intensity of the interfering reflected radiation beams. The time rate of change of the frequency of the output signal of the receiver is directly related to the vertical gradient of gravity. The instrument of this invention has means to determine, and if desired correct for, deviations of the optical axis of the instrument from the local vertical, rotational motion of the instrument which will cause undesirable Coriolis accelerations and means to compensate for undesirable horizontal motion. This gravity gradiometer is particularly suitable for use aboard moving platforms such as ships, planes and helicopters.

3,727,463

SHORTED TURN AXIAL DRIVER-SENSOR

Julius Intraub, Plainview, N.Y., assignor to Kollsman Instrument Corporation, Syosset, N.Y.

Filed March 18, 1971, Ser. No. 125,577
Int. Cl. G01l 9/10, 7/08
U.S. Cl. 73—398 R **12 Claims**



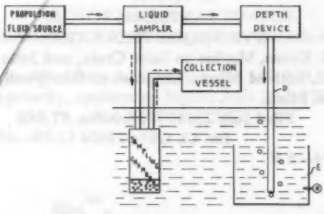
A pressure measuring system utilizes an aneroid capsule as the frequency determining mechanical feedback element of an electrical oscillator, the capsule having closely spaced diaphragm walls, each carrying a separate electromagnetic element cooperating with a separate magnetic yoke assembly. Each electromagnetic element is a copper sleeve defining a shorted turn at its free end that is axially movable in an annular gap defined by the magnetic yoke. Each yoke assembly includes a soft iron core section projecting through a cylindrical pole face to define a radial flux field in the annular gap for coupling with the shorted turn.

3,727,464

LIQUID SAMPLING

Michael D. Rutkowski, Phoenixville, and Robert K. Stanley, Media, both of Pa., assignors to Pro-Tech, Inc., Malvern, Pa.

Filed April 14, 1972, Ser. No. 244,105
Int. Cl. G01n 1/14
U.S. Cl. 73—421 B **17 Claims**



Repetitive sampling of liquid from a body thereof is controlled in frequency, dependent upon the depth of the liquid being sampled, so as to accord with the volume of the body thereof. Such depth-proportioning is accomplished, in a system using pressurized gas as a propulsion fluid and determining sampling frequency by gradual release thereof from a source to accumulate to a switching pressure at a given location, through bleeding off part of the accumulating gas against the back pressure of the depth of liquid. Principal uses are in stream monitoring for pollution control, in sewage treatment facilities, and in industrial waste reduction programs.

3,727,465

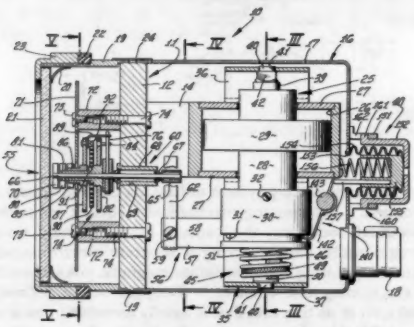
ACCELEROMETER

Ezra Dale Hartley, 2700 Jalmia Drive, Los Angeles, Calif.

Filed Aug. 6, 1970, Ser. No. 61,747
Int. Cl. G01p 15/04
U.S. Cl. 73—492 **14 Claims**

An accelerometer having an axially movable inertial body restrained by a coaxial coil spring rotated onto the external

thread of an externally and internally threaded rotatable collar on a threaded post protruding from a frame with rotation of the coaxial and/or the spring selectively changing the neutral position of the body and/or the effective length of the spring for calibration. A flat flexure member connects the body to the rack of a pointer operating drive train to reflect the displacement of the body independently of limited rotation of the body. Oppositely spring biased ratched wheels are connected to a pair of maximum memory pointers rotatable by the operating pointer. Flexible reed pawls mounted on a forwardly biased slidable block with a V-notch are positioned for en-



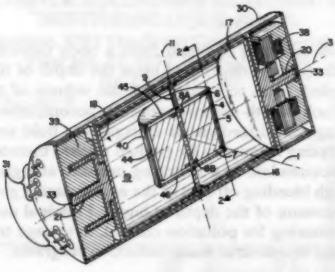
gagement with the ratchet wheels to maintain the memory pointers at their positions of maximum rotation. The pawl block is slidable rearwardly to free the ratchet wheels, and reset the memory pointers, by a push-button operated rod extending through an opening in an hermetically sealed container surrounding the frame, with sealing maintained by a flexible bellows which pivots with the rod. The body is locked for shipment by a hook that is pivoted to the frame and spring biased into the body with a push-button being provided through the container and sealed by a bellows, for pivoting and holding the hook against the biasing force and away from the body.

3,727,466

GYRO NOISE REDUCTION

Gerald M. Kraus, Marine on Saint Croix, and John G. Rupert, St. Paul, both of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed July 23, 1970, Ser. No. 57,558
Int. Cl. G01c *19/04*
U.S. Cl. 74—5 R **6 Claims**



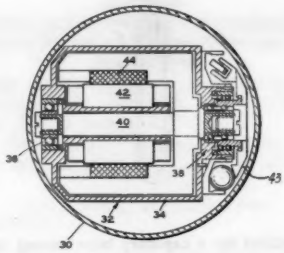
A method and apparatus for reducing output noise from a gyro having a spinning inertial element surrounded by gas. The mass of gas spinning with the rotor is minimized by shrouding the rotor. Particular shrouding reduces the Reynolds number of the gas proximate the rotor thereby producing a steady laminar gas flow within the gyro gimbal; the elimination of unsteady turbulent flow within the gimbal is accompanied by considerable noise reduction.

3,727,467

SPEED REDUCING BEARING ARRANGEMENT FOR A MECHANICALLY ERECTED VERTICAL GYRO

Charles E. Hurlburt, River Edge, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed June 10, 1971, Ser. No. 151,655
Int. Cl. G01c *19/30*
U.S. Cl. 74—5.41 **3 Claims**



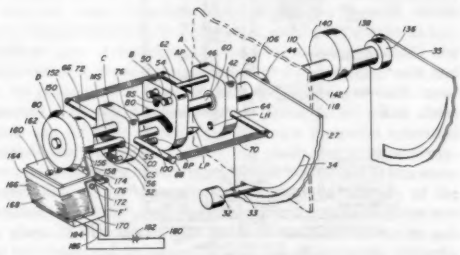
A speed reducing bearing arrangement of the type including a dual bearing having a common race and separate complementing races and balls so selected that the contact angle of one complement of inner and outer race is different than the contact angle of the other complement of inner and outer race is used for coupling an erection mechanism for a mechanically erected vertical gyro to the gyro rotor for rotating the erection mechanism in the same direction as the rotor but at a greatly reduced speed.

3,727,468

ROTARY MOTION TRANSMITTING DEVICES

Robert O. Ganser, Norwalk, and Igor E. Dolgen, Monroe, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 10, 1971, Ser. No. 114,202
Int. Cl. F16h *21/02*
U.S. Cl. 74—63 **7 Claims**

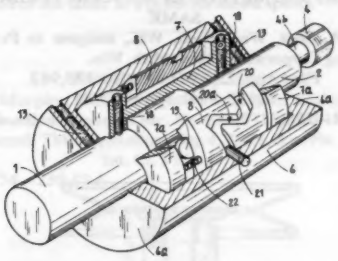


A rotary drive mechanism includes a firs driving element rotatable about a first main axis, carrying a driving pin which connects it to a second intermediary element, which is usually constrained to rotate about a second axis, more remote than the first axis from the driving pin connection. The intermediary element carries a second driving pin connected to a third finally driven element which is constrained to rotate about the same first axis, the second driving connection being closer to the second axis than the first axis. In this manner, the third element is driven at a compound reduction angular rate equal to the product of the reduction rates caused by each of the two connections between the elements. Means are also provided for optionally both freeing the shaft defining the second axis so as to release this constraint on the intermediary element, and for connecting the third finally driven element directly to the first driving element, thereby producing a direct or 1:1 angular rotation rate therebetween.

3,727,469
TAP-CARRIER

Maurice L. Matthey, Versoix, Switzerland, assignor to Manutar S.A., Fribourg, Switzerland

Filed June 2, 1971, Ser. No. 149,232
Claims priority, application Switzerland, June 4, 1970, 8437/70
Int. Cl. F16h 27/02
U.S. Cl. 74—89 2 Claims

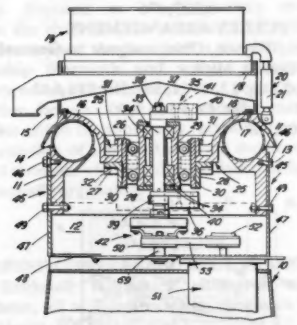


A tap carrier designed to impart to a tap a certain amount of angular play, of limited amplitude resulting in a dead motion, starting at the moment when rotation is reversed and having a determined angular value, all compensating for any lack of synchronization between the rotational and forward displacements which temporarily occur after reversal.

3,727,470
VIBRATORY APPARATUS

Marcel Henry Choules, Woking, England, assignor to Russell Finex Limited, London, England

Filed July 12, 1971, Ser. No. 161,550
Claims priority, application Great Britain, Nov. 4, 1970, 52,923/70
Int. Cl. B06b 1/16
U.S. Cl. 74—87 9 Claims

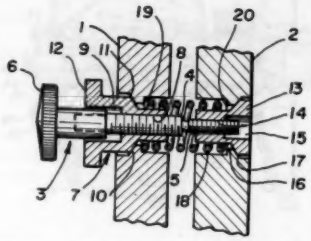


A vibratory apparatus comprising a vibratory frame resiliently mounted on a base. An out-of-balance weight assembly is mounted on the frame, the assembly being adjustable about a horizontal axis passing through the frame. Power drive means for the out-of-balance weight assembly is mounted on a frame which is mounted on the base and adjustable about substantially the same axis. A resilient coupling may connect the power drive means to the out-of-balance weight assembly and an inflatable ring may be arranged to support resiliently the vibratory frame on the base.

3,727,471
COARSE AND FINE ADJUSTMENT AND POSITIONING MECHANISMS

Stephen J. Botos, 112 Tent St., Pittsburgh, Pa.

Filed Sept. 20, 1971, Ser. No. 181,675
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 8 Claims

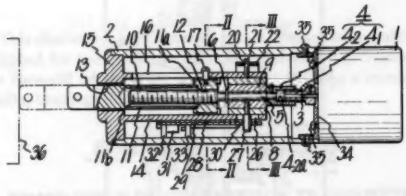


A mechanism for effecting both coarse and fine adjustment or positioning of an element includes a fine resolution positioner comprising a longitudinally extending shaft having two threaded sections of different pitch. Threadably received on one of the threaded sections is a coarse range selector which is mounted for free rotative motion on a seat in a support plate. An adjusting member is threadably received on the other threaded section of the fine resolution positioner. Coarse adjustment or positioning is accomplished by turning the coarse range selector, resulting in longitudinal movement of either the selector or the adjusting member along the fine resolution positioner. Fine adjustment or positioning is accomplished by turning the fine resolution positioner which results in its turning in both the coarse range selector and adjusting member to effect displacement of both along the fine resolution positioner. The relative displacement between the two is a function of the difference in the pitches of the two threaded sections of the fine resolution positioner on which they are respectively received.

3,727,472
MOTOR-DRIVEN ACTUATOR

Mitugi Maekawa, 45-53 Midorgaoka-1, Choufu-shi, Tokyo, Japan

Filed June 2, 1971, Ser. No. 149,214
Claims priority, application Japan, June 22, 1970, 45/53877
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 2 Claims



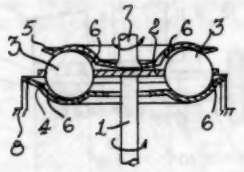
A motor-driven actuator comprises a reversible motor, a first shaft with a male screw formed at the front portion thereof, a second shaft, and a coupling for slidably and rotatably coupling the first shaft and the rotary shaft of the reversible motor. In this case, the second shaft has female threads engaged with the male screw of the first shaft and the first shaft is rotatably supported by a bearing which is slidably supported by a support, whereby the second shaft is moved in its axial direction.

3,727,473

VARIABLE SPEED DRIVE MECHANISMS

Edward Bernard Bayer, 27, Melrose Gardens, North St., Ilovo, Johannesburg, Republic of South Africa

Filed April 14, 1971, Ser. No. 133,797
Int. Cl. F16h *15/08*
U.S. Cl. 74—198 **15 Claims**



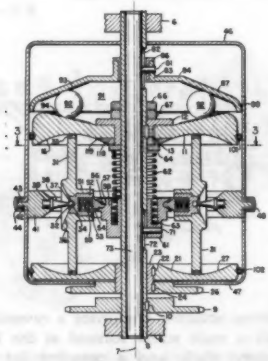
A variable speed drive mechanism is disclosed wherein a rotatable drive member imparts movement to a driven member through a cage containing a series of rotary elements sandwiched between the two members, at least one of which is resiliently flexible. The elements engage a circular track comprising grooves of concave cross-sectional configuration disposed on the members. The grooves are of slightly larger diameter than the elements so that on flexing one of the members the effective radius of contact between the elements and the groove walls may be varied and the rotational speed imparted to the other member varied accordingly. A single directional variable speed unit is thus provided. In another unit two sets of rotary elements of the aforesaid kind are linked in back to back relationship with their cages interconnected to provide a variable speed unit with a greater speed range which passes through zero and is reversible. These units not only require fewer components than the conventional comparable unit, but the components are also relatively simple and cheap to manufacture.

3,727,474

AUTOMOTIVE TRANSMISSION

Robert L. Fullerton, South Lake Tahoe, Calif., assignor to Fullerton Transiission Company, Sacramento, Calif.

Filed Oct. 4, 1971, Ser. No. 186,273
Int. Cl. F16h *15/08, 37/12*
U.S. Cl. 74—200 **14 Claims**



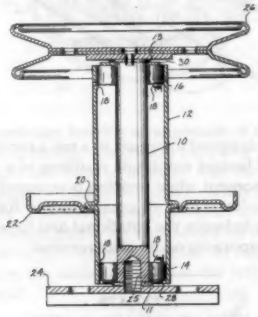
An automotive transmission has a drive tube rotatably mounted on a frame and carrying a drive disc having a first half-toroidal friction surface and a free-running neutral disc having a friction surface continuing the first friction surface. A driven tube is also rotatably mounted on the frame and carries a driven disc having a second half-toroidal friction surface facing the first friction surface. Tiltably and rotatably mounted between the discs are transmission discs frictionally engageable with the friction surfaces. The transmission discs are tiltable to afford various speed ratios and a neutral position. The tilting device is either manual or centrifugal. The output is either direct or through a planetary reversing gear.

3,727,475

PULLEY-AND-SHAFT ASSEMBLY FOR ROTARY LAWN MOWERS AND METHOD OF MANUFACTURING THE SAME

William W. Steil, Wauwatosa, Wis., assignor to Production Stamping Corporation, Milwaukee, Wis.

Filed Aug. 23, 1971, Ser. No. 173,982
Int. Cl. F16h *55/34, 55/36*
U.S. Cl. 74—230.3 **9 Claims**



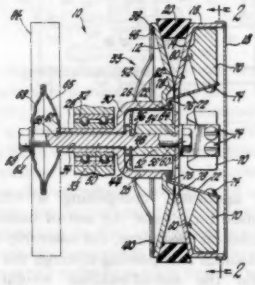
An outer sleeve supports upper and lower bearing assemblies in which a drive shaft for a lower blade is journalled. The lower end of the shaft is friction-welded to a blade saddle and the upper end is friction-welded to the lower face of a drive pulley. The sleeve is prepared with an annular bulge intermediate its length and a support ring which fits around the sleeve is friction-welded to the lower face of the annular bulge.

3,727,476

PULLEY ARRANGEMENT

John H. Heldorn, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1971, Ser. No. 171,643
Int. Cl. F16h *9/00*
U.S. Cl. 74—230.17 E **6 Claims**



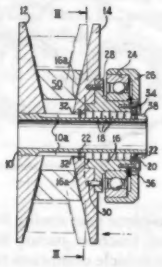
The adjustable pulley or speed changer assembly illustrated includes a fixed and movable wall, with the fixed wall being connected at its outer edge to normally bowed resilient spoke

members secured to the reciprocally movable shaft to which the movable pulley wall is also secured. As the belt is loaded up, it moves radially inwardly, forcing the movable wall away from the fixed wall, and thereby axially moving the shaft and straightening the normally bowed resilient spoke members, without any sliding fits being involved. As the load on the belt is relieved, the distorted spoke members cause the movable wall to return toward the fixed wall, progressively forcing the belt radially outwardly between the pulley walls. Centrifugal weights secured by flexible arms to the fixed wall abutment, in contact with the movable wall, serve to limit the separating movement of the latter at a predetermined speed.

3,727,477
POWER TRANSMISSION

Michael Murphy, 29 Cartwright Street, Hyde, England

Continuation-in-part of Ser. No. 816,571, April 16, 1969, abandoned. This application May 4, 1971, Ser. No. 140,292
Int. Cl. F16h *11/06*
U.S. Cl. 74—230.17 A **9 Claims**



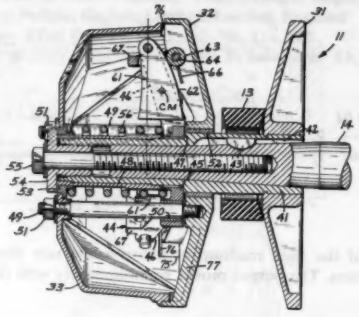
The invention concerns power transmission involving rotation of a member by means of a driven shaft on which the member is mounted and where axial movement of the whole or part of the member relative to the shaft is required, and deals with the problem of fretting corrosion in such transmissions. The invention involves the provision of a shaft, a member specially a V-pulley having a fixed flange, and an axially adjustable flange mounted thereon and a plurality of roller bearings disposed in complementary arcuate grooves, between the shaft and the member. The roller bearings are adapted to support the member on the shaft in axially slidable relationship therewith and with a clearance maintained therebetween, and at the same time provide a rotary driving connection between the shaft and the member, and continually to adjust themselves by rotation in one direction only, during rotation of the shaft and the member, in response to imposed stresses, whereby the incidence of fretting corrosion is substantially precluded.

3,727,478
SPEED CONTROLLED BELT TRANSMISSION

Albin Erickson; William R. Richards, and Clement F. Deschene, all of Roseau, Minn., assignors to Textron Inc., Providence, R.I.

Continuation of Ser. No. 869,166, Oct. 24, 1969, abandoned. This application Aug. 23, 1971, Ser. No. 174,148
Int. Cl. F16d *43/06*; F16h *55/52*
U.S. Cl. 74—230.17 E **12 Claims**

The disclosure is directed to an improved centrifugal clutch the structure of which permits its use with engines having different performance characteristics, and enables simple modification resulting in a desired performance relationship with the selected engine. One feature centers on a plurality of flyweights, each having an engageable cam surface that relates engine revolutions-per-minute to the input/output revolution ratio to effect a simulated gear shifting transmission characteristic. Other features are directed to laminated flyweights made of different materials to obtain the proper centrifugal

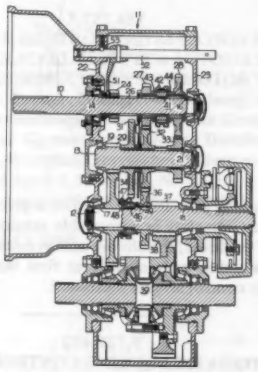


action, and the mounting of flyweights having predetermined centers of mass to obtain the greatest mechanical advantage at the optimum time.

3,727,479
COMBINED TRANSMISSION

Ronald E. Wilson, Lee's Summit, Mo., assignor to Allis-Chalmers Corporatn, Milwaukee, Wis.

Filed June 25, 1971, Ser. No. 156,873
Int. Cl. F16h *3/08*
U.S. Cl. 74—333 **7 Claims**



This disclosure is concerned with a transmission particularly adapted for use in a combine harvester and it provides multiple forward and reverse speeds while utilizing a minimum of shafts, bearings and gears.

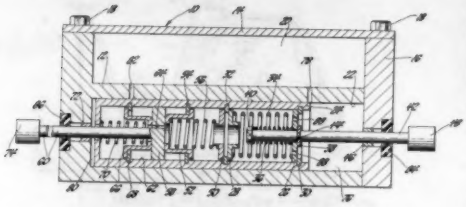
3,727,480
TIMED INPUT-OUTPUT MOTION TRANSMITTING DEVICE

Lester E. Need, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

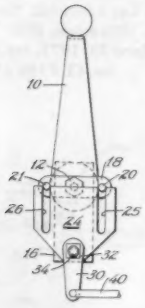
Filed Dec. 8, 1971, Ser. No. 205,845
Int. Cl. G05g *1/00*
U.S. Cl. 74—470 **3 Claims**

A motion transmitting mechanism having a predetermined delay between input and output motion. Movement of the input is transmitted through a lost motion device, such as a spring, to an input piston. Movement of the input piston causes the displacement of a fluid medium which flows at a

controlled rate through a restriction. Movement of the input piston is transmitted to an output piston through a lost motion device. Movement of the output piston causes the displacement of the fluid medium at a controlled rate through the restriction. The output moves simultaneously with the output piston.

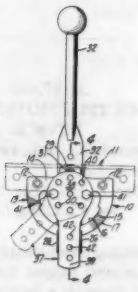


3,727,481
VARIABLE RATIO CONTROL LEVER
John A. Nicholson, 1650 Carrol Avenue, St. Paul, Minn.
Filed April 8, 1971, Ser. No. 132,411
Int. Cl. G05g *1/04*
U.S. Cl. 74—491 **4 Claims**



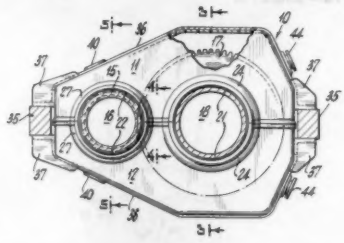
Two camming pins are mounted on a pivoting control lever so as to slide into slots in a pivotable actuating member upon rotation of the lever, the sliding action operable to rotate the actuating member only slightly at first but more so as the throw of the control lever is increased.

3,727,482
AUTOMATIC LOCKING CONTROL DEVICE
Larry A. Geer, Upland, Calif., assignor to Adams Rite Manufacturing Company, Glendale, Calif.
Filed June 15, 1971, Ser. No. 153,176
Int. Cl. G05g *5/16*
U.S. Cl. 74—531 **15 Claims**



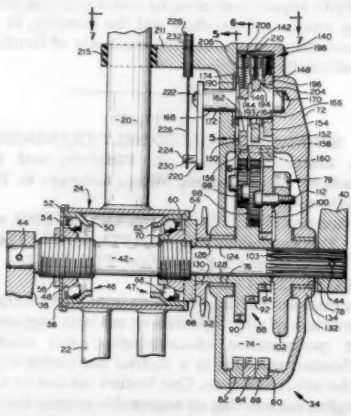
An irreversible control device in which an input member is connected with an output member through a locking element which is fulcrumed on a fixed locking bar for swinging movements to locked and unlocked positions respectively with the locking bar, and is normally spring-urged into an unlocked position which permits the output member to be moved freely to different positions of adjustment in response to selective movements of the input member, but in an adjusted position will be fulcrumed to a locked position on the bar in response to an attempted movement of the output member away from its adjusted position by reverse operation by means of the output member.

3,727,483
GEAR CASING
Melvin A. Hanson, Downers Grove, and Alexander Zunich, Glenview, both of Ill., assignors to NL Industries, Inc., New York, N.Y.
Filed Sept. 27, 1971, Ser. No. 184,018
Int. Cl. F16p *1/02*
U.S. Cl. 74—609 **14 Claims**



An improved two-piece gear casing for housing a gear train associated with the traction motor supporting-frame of a locomotive or other vehicle comprises two integrated substantially identical half-casings molded of reinforced plastic material in combination with load-bearing metal straps adapted to embrace the half-casings in a manner to secure them together on the supporting frame of a traction motor and to lock each half-casing from lateral displacement relative to its load-bearing strap.

3,727,484
SPEED CHANGING TRANSMISSION
Dennis W. Shea, Toledo, Ohio, and William C. Stoneman, Temperance, Mich., assignors to Dana Corporation, Toledo, Ohio
Filed May 3, 1971, Ser. No. 139,486
Int. Cl. F16h *57/10, 3/44*
U.S. Cl. 74—768 **16 Claims**



A 3-speed transmission of the planetary type having three sets of planet gears, three sun gears and three ring gears. All

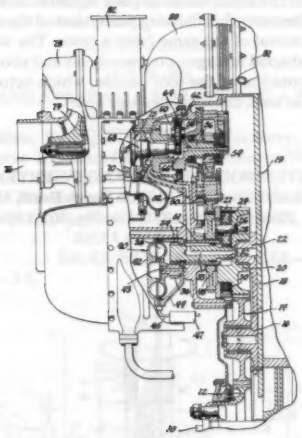
planet gears are mounted on and driven by one common carrier which is connected to the input shaft. The sun gears are carried by an output shaft which is rotatably mounted on the input shaft and which extends from the transmission housing to carry a driving sprocket. A shifting mechanism, including a plurality of spring loaded pawls engageable with the ring gears and operable by a slotted shifting shaft, is selectable to maintain a desired one of the ring gears stationary relative to the housing to provide the desired speed ratio between the input and output shafts. The transmission is shown adapted for use as a bicycle drive and mounted such that the transmission housing is fixed against rotation relative to the bicycle frame; the pedal crank being the input shaft to the transmission and extending completely through the same and being rotatably mounted in the bicycle housing with the sun gear driven output shaft rotatably mounted on the input shaft.

3,727,485

POWER TRANSMISSION

Bruno A. Duerr, La Grange Park, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed July 2, 1971, Ser. No. 159,210
Int. Cl. F16h *3/00*
U.S. Cl. 74—782 **6 Claims**



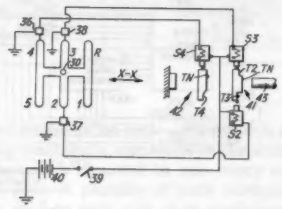
Turbocharger drive having planetary gear units in a gear train between an engine crankshaft and a compressor rotor, which rotates to supply air to an engine for combustion. The reaction member of a planetary unit of the gear train is connected to the pump of a hydrodynamic unit while the turbine member is grounded so that the stall torque of the unit retards rotation of the reaction member to permit the engine crankshaft to drive the rotor through the gear train. The hydrodynamic unit having an infinite number of spring rates provides an infinitely flexible device for reducing transmission of engine torsionals and shock loads through the gear train. The mechanical drive is assisted by a gas drive from the engine exhaust which progressively increases as the engine approaches full load and the rotor becomes fully driven by the engine exhaust gases. When the gas drive speed and load equals the rotor needs, the mechanical system reaches a no-load condition.

3,727,486

ENGINE HAVING IMPROVED PERFORMANCE CHARACTERISTICS

Nicholas Martin Felix Vulliamy, Peterborough, England, assignor to Perkins Engines Limited, London, England

Filed Feb. 11, 1971, Ser. No. 114,652
Claims priority, application Great Britain, Feb. 13, 1970, 7,011/70
Int. Cl. B60k *21/00*
U.S. Cl. 74—860 **10 Claims**



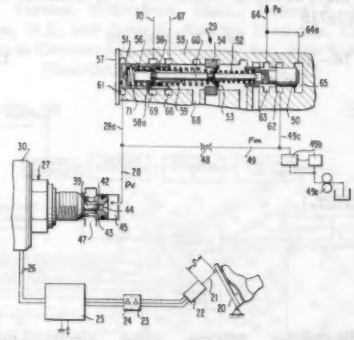
A pressure charged engine and gearbox assembly providing a number of drive ratios and including means which, on selection of certain of the gears below the top gear, conditions the fuelling apparatus of the engine to provide more fuel at the same engine speed than it does in top gear. The presence of pressure charged air enables the fuel to be burnt efficiently and extra power is made available by virtue of the higher brake means effective pressure so produced.

3,727,487

PRESSURE CONTROL INSTALLATION FOR HYDRAULICALLY SHIFTED AUTOMATIC TRANSMISSIONS, ESPECIALLY FOR MOTOR VEHICLES

Hans-Joachim M. Forster, Stuttgart-Riedenberg; Arwed Von Koch, Stuttgart-Sonnenberg, and Hermann Gaus, Stuttgart-Sillenbuch, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuffgart-Untertrkheim, Germany

Filed April 2, 1970, Ser. No. 25,121
Claims priority, application Germany, April 3, 1969, P 19 17 291.9
Int. Cl. B60k *21/02*; F16k *31/02*
U.S. Cl. 74—865 **11 Claims**

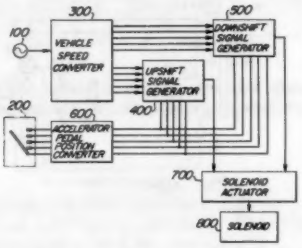


A pressure control installation for hydraulically shifted automatic transmissions, particularly for motor vehicles, which controls the pressure of a hydraulic medium that effects the shifting operations in dependence on an operating magnitude, whereby the regulation of the pressure is achieved electrically, preferably by the use of a solenoid valve controlling a pilot pressure.

3,727,488
SYSTEM FOR SHIFTING GEAR POSITIONS OF AUTOMATIC TRANSMISSIONS FOR AUTOMOTIVE VEHICLES AT PREDETERMINED SHIFT POINTS

Hisato Wakamatsu; Hiroshi Fujinami, both of Kariya, and Tokuhiro Kurebayashi, Anjo, all of Japan, assignors to Nipponsenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

Filed July 20, 1971, Ser. No. 164,316
Claims priority, application Japan, July 21, 1970, 45/63855
Int. Cl. B60k *21/00* ; F16h *3/74*
U.S. Cl. 74—866 1 Claim

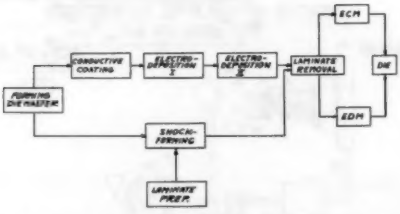


A system for shifting the gear positions of an automatic transmission for a vehicle at a plurality of predetermined shift points in which an r.p.m. detecting a.c. generator is connected to the wheel driving system and the output from the AC generator is converted into a pulse signal. The number of pulses appearing within unit time is counted and the count is classified to obtain a plurality of digital vehicle speed signals corresponding to a plurality of vehicle speed settings. The accelerator pedal is connected to a movable contact of a multicontact switch having a plurality of stationary contacts so as to obtain a plurality of digital throttle position signals representative of various positions of the accelerator pedal. The digital vehicle speed signal and digital throttle position signal are applied to a logic circuit to obtain a shift signal.

3,727,489
DIE-MAKING PROCESS

Kiyoshi Inoue, Tokyo, Japan, assignor to IJR (Inoue-Japax Research Inc.), Midoriku, Yokohama, Japan

Continuation-in-part of Ser. No. 723,799, April 24, 1968, Pat. No. 3,591,760. This application March 17, 1971, Ser. No. 125,192
Claims priority, application Japan, June 28, 1967, 42/41494; Sept. 2, 1967, 42/56310; March 17, 1970, 45/22543; March 30, 1970, 45/26715
Int. Cl. B21k *5/20*
U.S. Cl. 76—107 R 15 Claims

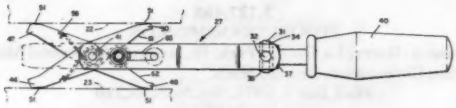


A die-making process using electrical-machining techniques, i.e., EDM and/or ECM, whereby a die master is first prepared having a surface configuration closely complementary to that of a desired die-surface pattern and a contour corresponding to that of the article to be produced. Upon the die-master surface and in intimate contact therewith, an electrically conductive die-facing layer is formed by electrodeposition or by a high-energy-rate-forming (shockwave-forming) system. This layer is then used as an electrical-machining electrode for machining a conductive block of backing material to impart thereto a configuration complementary to the surface of the machining electrode or the layer thereby preparing a backing body for the latter. The machined body and the layer are matingly engaged and bonded together, the surface of the layer originally in contact with the die master surface forming a desired die surface for use. The layer is, preferably, two laminated layers, formed of materials adapted for die use and for use as an electrode in the electrical-machining step.

3,727,490
DISC BRAKE PAD SPREADER

Walter L. Diffenderfer, and Frederick R. McFarland, both of Lancaster, Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.

Filed Aug. 5, 1971, Ser. No. 169,187
Int. Cl. B25b *27/00*
U.S. Cl. 81—3 K 11 Claims

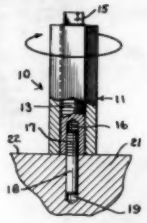


A spreading tool is provided, particularly adapted for use with disc brakes, as for example of automobiles, trucks and the like, wherein the spreader is a hand-actuable tool for insertion between the brake shoes or pads mounted in a caliper, for spreading the same, for allowing placement of the shoes over a rotor, or removal of the same from a rotor. The tool uses one or more X-shaped linkages, commonly pivotal about a shaft or axis, upon rotation of the tool handle, which actuates a drive screw, that in turn, cams linkage legs apart.

3,727,491
STUD BOLT PULLER AND INSERTER

Sanford L. Buckwalter, 406 Shelton Beach Road, Mobile, Ala.

Filed Nov. 26, 1971, Ser. No. 202,139
Int. Cl. B25b *13/50*
U.S. Cl. 81—53.2 4 Claims



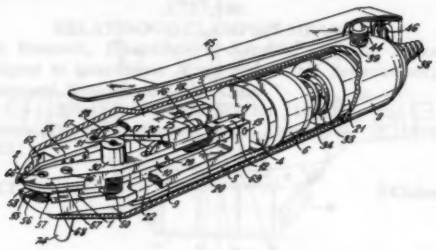
This stud bolt puller can be readily secured to the threaded portion of a stud bolt and upon turning one of its parts relative to the other part lift stud bolt from a stud block and out of the top surface thereof. The central member has a threaded bore for receiving the threaded portion of the stud bolt. The central spindle member has a square head for receiving a wrench and the other member is of hexagonal outer section for similarly receiving a wrench. The threads of the inner and outer member extend the full extent thereof so that the inner member can be worked through the outer member. With the stud inserted into the central member the puller can be struck with a hammer upon the head portion of the central member to force the full portion of a stud bolt into a undersized hole in the stud block.

3,727,492

MACHINE FOR CUTTING AND STRIPPING BACK ELECTRIC WIRES AND CABLES

Vincenzo Zanni, Ivrea, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea, Italy

Filed March 18, 1971, Ser. No. 125,782
Claims priority, application Italy, March 21, 1970, 67982 A/70
Int. Cl. H02g 1/12
U.S. Cl. 81—9.5 A 13 Claims



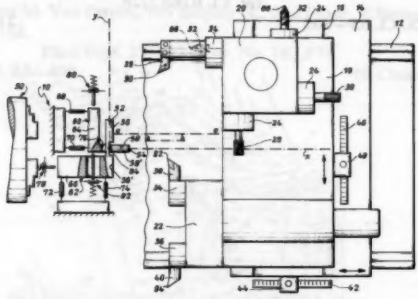
A hand-held device is disclosed for cutting electrical wires and cables while stripping the sheath from a short section thereof. Two pairs of jaws are provided, the first pair clamping a section of the wire, while the second pair, which is pivotally movable relative to the first pair in the direction of the wire axis, notches and strips the wires sheath, and cuts the wire. The device is powered by compressed air actuated piston.

3,727,493

METHOD AND APPARATUS FOR SETTING A TOOL OF A MACHINE TOOL

Heinrich Lahm, Esslingen, N.-Sirnau, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen/Neckar, Germany

Filed Sept. 1, 1970, Ser. No. 68,653
Claims priority, application Germany, Sept. 5, 1969, P 19 45 017.0
Int. Cl. B23b 1/00, 7/00
U.S. Cl. 82—1 C 20 Claims



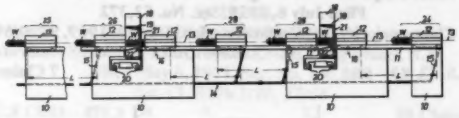
A program controlled tool of a machine tool is moved in a setting operation in two perpendicular directions to a reference position in which a cutting point thereof is located in the line of intersection of two perpendicular planes which are perpendicular to two directions, respectively in which the cutting point is moved. Data representing the setting movements of the tool are stored in program controlled means, and when the cutting point is located in the reference line, a signal is transmitted by sensing means to the program control means so that consequent working movements of the tool can be program controlled with reference to the line of intersection.

3,727,494

INSTALLATION FOR MACHINING CRANKSHAFTS, CAMSHAFTS OR LIKE WORKPIECES

Hans Gunther Rohs, 9 Richard-Wagner-Strasse, Rechberghausen, Germany

Continuation-in-part of Ser. No. 14,485, Feb. 26, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,380
Int. Cl. B23b 15/00
U.S. Cl. 82—2.5 5 Claims



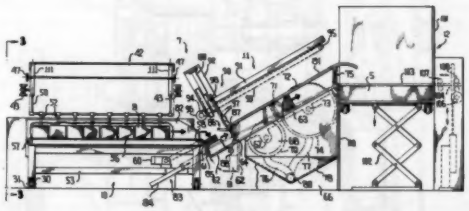
The subject matter of the present invention is an installation for machining crankshafts, camshafts or like workpieces. Each of the workpiece is mounted in non-rotary condition in a workpiece holder. A plurality of such workpiece holders is guided on a straight path with their workpieces in co-axial relationship to each other and to said path. A plurality of tool units is distributed in spaced relationship along the path. Each unit includes an annular rotary tool having internal cutting edges. This tool surrounds an internal clearance space which is larger than the cross-section of the workpiece holders. Therefore, each tool affords passage of said workpiece holders through the clearance space. Each of the tool units further comprises means for moving the annular rotary tool into a position in which its internal clearance space is in registry with the path of the workholders. Conveyor means are provided for intermittently transporting said workpiece holders with the workpieces on a guideway along the path through the clearance spaces of the tool units and for temporarily stopping each workpiece holder in a position in which its workpiece is surrounded by said annular rotary tool and in a position to be machined by the cutting edges thereof. The conveyor means may comprise drag members which are distributed along the path and are adapted to engage the workpiece holders. These drag members are reciprocated parallel to said path in synchronism with each other and thereby feed each of the workpiece holders step by step along the path consecutively through the annular rotary tools.

3,727,495

AUTOMATIC PARTITION CUTTING MACHINE

Roy E. Vermes, Wilbraham, Mass.; Robert L. Nebeling, Wayne, N.J., and John E. Knecht, Riverdale, Conn., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,323
Int. Cl. B26d 7/06
U.S. Cl. 83—35 20 Claims



This disclosure relates to a machine for automatically cutting partitions and stacking the same. The partitions are formed by first slitting a stack of sheets into a bundle of strips, then serially moving the bundles of strips onto on edge positions with the rotated bundles then being serially moved to become part of a large group of on edge strips which are then moved through appropriate saws to divide the strips into

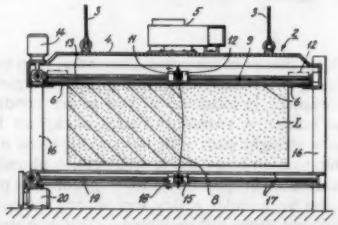
predetermined length partitions and to notch or slit the same. In the movement of the on edge strips, after they move past the saws, the cut and slit strips (partitions) are moved into stacked relation.

3,727,496

METHOD OF AND APPARATUS FOR CUTTING UP SEMI-PLASTIC LIGHT WEIGHT CONCRETE BODIES

Rolf Erik Goransson, Alvsjo, Sweden, assignor to Internationella Siporex Aktiebolaget, Stockholm, Sweden

Filed July 6, 1970, Ser. No. 52,372
Claims priority, application Sweden, July 10, 1969, 9790/69
Int. Cl. B26d 7/00
U.S. Cl. 83—56 **7 Claims**



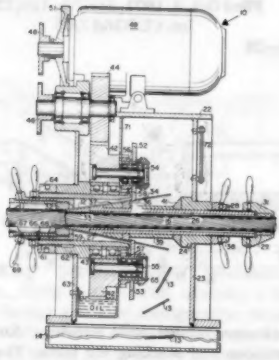
Cutting up of a semi-plastic cellular light weight concrete body by passing string-like cutting members having, when operative, a substantially vertical extension in a horizontal direction therethrough is effected while the body to be cut is kept freely suspended from a perforated bottom of a hood-like suspension device, in which a sufficient vacuum is created to maintain adhesion by suction between the top of the body and said perforated bottom. The cutting members pass through and are moved along in slots formed in the bottom of the suspension device, their upper ends being actuated for movement above said bottom and their lower ends being separately actuated by driving means mounted in a stand separate from the suspension device but engaging therewith in a guiding manner, when cutting is effected.

3,727,497

APPARATUS FOR SEPARATING AND SHEARING A CABLE STRAND

Charles H. Davis, Shrewsbury, N.J., and Lech Stanislaw Borczyk, Long Island City, N.Y., assignors to Anaconda Wire and Cable Company, New York, N.Y.

Filed April 14, 1971, Ser. No. 133,936
Int. Cl. B26d 7/00
U.S. Cl. 83—167 **12 Claims**



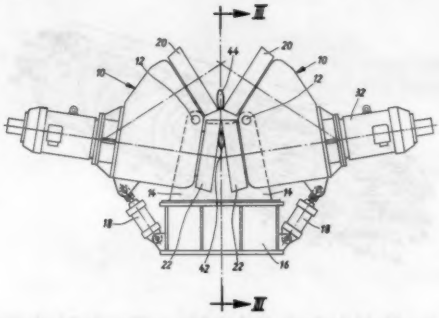
An apparatus for cutting an outer layer of helical wires from a cable core comprises an annular shear blade through which the core is advanced and planetary circular shear blades that cut the wires as they pass over the annular blade.

3,727,498

ROTARY SHEAR

Michael Poran, New York, N.Y., assignor to Danieli and C.S.P.A., Buttrio (Udine), Italy

Filed Sept. 10, 1971, Ser. No. 179,472
Claims priority, application Germany, June 28, 1971, P 21 32 125.5
Int. Cl. B23d 19/04; B26d 7/06
U.S. Cl. 83—106 **6 Claims**



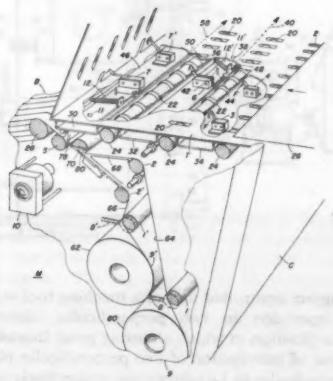
Two pairs of discs mounted on mutually inclined shafts each have concentric cutting edges on opposed faces, one pair of discs being mounted generally edge-to-edge in relation to the other pair. The discs are movable, so that the cutting edges of one pair form a cutting zone at one peripheral location while those of the other pair are spaced to form a gap, and vice versa. Stock to be cut is fed tangentially into the general area of these zones, its path of travel being moved radially outwardly of the discs forming a cutting zone and through the gap in the other pair of discs, this direction of movement then being reversed, after the disc positions have been reversed, and so on, thus enabling a series of cuts to be made.

3,727,499

AUTOMATIC ROLL-SUPPLIED COPY MATERIAL-FEEDING AND CUTTING MECHANISM

Robert L. Boston, Vestal, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed March 19, 1971, Ser. No. 126,233
Int. Cl. B26d 5/28
U.S. Cl. 83—205 **2 Claims**



As an original sheet, such as a tracing, to be copied on a sensitized sheet in an automatic copying machine moves longitudinally in the flat on a horizontal surface, the front and rear edges of the origianl sheet actuate sensor switch which energize control circuits to cause a web to be drawn from a

selected one of two supply rolls of copy paper in which lightly tensioned slack is provided to improve the start of the web feed, and a loop is initially formed in the web at the exit of a web cutting station to provide for subsequent cutting of the web which the part being cut is stationary and the part in front continues to feed for perfect length-matching of the original and copy sheets, in conjunction with a speed control having a man-adjustable dial that is mechanically connected to shiftable switch mounts for synchronizing the operation of the mechanism.

3,727,500

RELATING TO CLAMPING MEANS

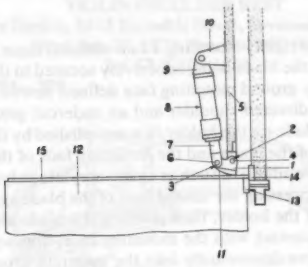
Emile Breetvelt, Johannesburg, Republic of South Africa, assignor to Intermenua (Proprietary) Ltd., Johannesburg, Transvaal, Republic of South Africa

Filed Feb. 17, 1971, Ser. No. 116,025

Claims priority, application South Africa, Feb. 25, 1970, 70/1251

Int. Cl. B26d *5/42*

U.S. Cl. 83—375 **5 Claims**



The invention relates to a shearing machine for the cutting of metal sheet and other sections and in particular to an hydraulic system of clamps used to locate the sheet being cut and in which the loads applied to the clamps is transferred from the hydraulic system to a mechanical linkage better able to resist these forces.

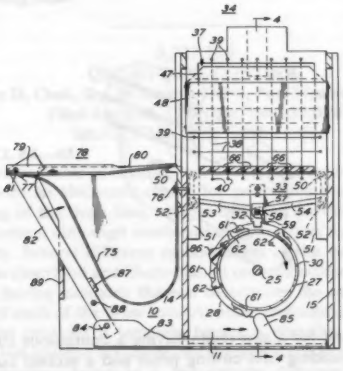
3,727,501

POTATO DICING MACHINE

Harrison M. Von Duyke, 709 Shipley St., 2nd Floor, Wilmington, Del.

Filed Sept. 27, 1971, Ser. No. 183,878

U.S. Cl. 83—438 **10 Claims**



Apparatus for dicing cooked potatoes which includes a base, support members for supporting the potatoes, longitudinally extending rods on the base carrying a pair of opposed cutting frames, which frames have metallic cutting wires thereon, and a rotary drive connecting the frames to provide horizontal motion to the frames to cut the potatoes into strips and providing timed motion to vertically movable blades carried by the frames to further dice the potatoes which can then be moved off the base and which apparatus includes an automatic potato feed also connected to the drive to place potatoes in position on the base between the frames for dicing.

3,727,502

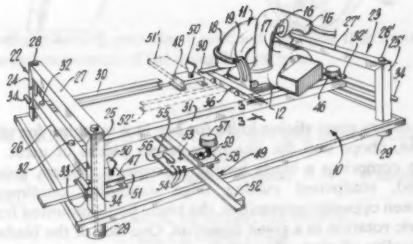
SAW-TABLE CONSTRUCTION

Abraham Steinman, 125 Croyden Court, Long Island, N.Y.

Filed May 6, 1971, Ser. No. 140,805

Int. Cl. B27b *5/20, 27/08*

U.S.Cl.83—471.3 **25 Claims**



The invention contemplates a saw-table construction with frame and slide features so devised as to accommodate a portable motorized saw or the like tool and to enable selective rip, cross-cut, mitering and other standard operations without requiring any remount of the tool, even if the tool is a circular saw. Provision is made for accommodating a variety of positioning adjustments of the tool with respect to the work, without having to change the basic mounting of the tool.

3,727,503

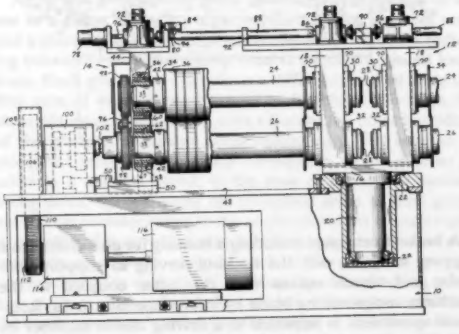
SLITTER HAVING PIVOTAL MULTIPLE SPACED PAIRS OF ARBORS

Harold R. Braner, Chicago; William C. Jasinski, Arlington Heights; Douglas S. Matsunaga, and Agapito Valencia, both of Chicago, all of Ill., assignors to Braner Engineering, Inc., Chicago, Ill.

Filed Nov. 26, 1971, Ser. No. 202,237

Int. Cl. B26d *1/24;* **B23d** *19/04*

U.S. Cl. 83—479 **6 Claims**



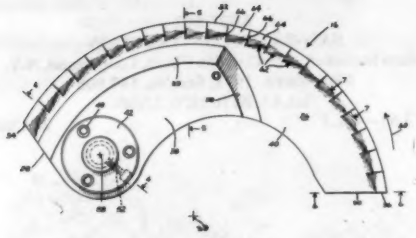
A slitter having multiple spaced pairs of arbors pivotally mounted to the slitter frame. Each pair of arbors is adapted to carry cutter assemblies which can be pivoted into operating position at the selection of the user of the slitter.

3,727,504

MEAT SLICING KNIFE

Anthony H. Osterholt, 4608 Euclid Avenue, Fort Wayne, Ind.

Filed Aug. 5, 1971, Ser. No. 169,213
Int. Cl. B26d 4/48
U.S. Cl. 83—483 8 Claims



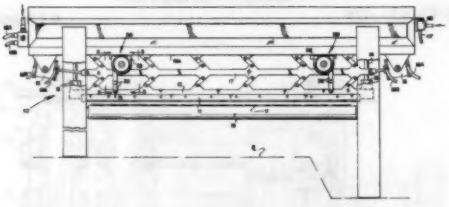
A rotary meat slicing knife for use in a machine for slicing steaks, chops and the like from larger pieces of meat. The knife comprises a blade having a convexly curved, uninterrupted, sharpened cutting edge extending continuously between opposite extremities, the blade being mounted for eccentric rotation in a given direction. One side of the blade has a plurality of circumferentially contiguous segments formed thereon adjacent the cutting edge and extending between its extremities, each of the segments comprising a surface which smoothly tapers away from the cutting edge and which also smoothly tapers in the direction of rotation toward the other side of the blade to the adjacent segment thereby forming a compound wedge configuration pointing toward the cutting edge and in the direction of rotation for separating a slice of meat from a larger piece upon one revolution of the blade.

3,727,505

BRAKE MECHANISM FOR A RECIPROCATING BLADE

Ernest P. Shaughnessy, Portland, Oreg., assignor to E. V. Prentice Co., Portland, Oreg.

Filed March 6, 1972, Ser. No. 231,991
Int. Cl. B26d 5/18
U.S. Cl. 83—526 15 Claims



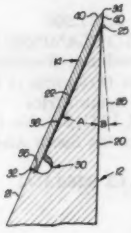
A brake mechanism including a housing for attachment to a clipping machine with the housing serving to support both brake and clutch means with the latter coupled to the machines reciprocating blade by interconnecting arms. Rotational movement is imparted to a driving clutch member by said arms with the clutch being of the uni-directional type permitting unrestricted downward movement of the blade while in an opposite direction engaging a cooperating driven clutch member to ultimately initiate brake operation to accomplish a non-rebounding type return of the blade to its rest position.

3,727,506

MICROTOME BLADE HOLDER

Dermot B. Taylor, 3914 Sierks Way, Malibu, Calif., and Daniel C. Pease, 13011 Sunset Boulevard, Los Angeles, Calif.

Filed May 6, 1971, Ser. No. 140,678
Int. Cl. B26d 1/00
U.S. Cl. 83—698 3 Claims



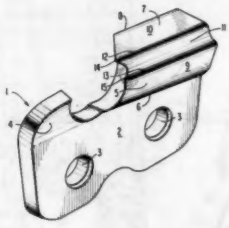
A holder for rigidly mounting a conventional razor blade on a microtome, the blade being adhesively secured to the holder on a precisely ground mounting face defined downwardly by an upwardly directed shoulder and an undercut groove. Assembly of a blade on the holder is accomplished by first coating one face of the blade and the mounting face of the holder with a flowable adhesive such as cyano acrylate polymerizing cement, then pressing the coated face of the blade against the upper edge of the holder, then pivoting the blade about that line into full contact with the mounting face, thus squeezing excess adhesive downwardly into the undercut groove, and finally sliding the blade downwardly so that its base bottoms against the shoulder. The shoulder must be sufficiently shallow to insure that no portion of the shoulder is exposed when the blade is mounted thereon, so that no obstruction impedes the downward sliding movement of a tissue section. Removal of a used blade is accomplished by inserting a pointed tool into the groove and prying the blade away from the holder.

3,727,507

SEMI-CHISEL CUTTER LINK FOR SAW CHAIN

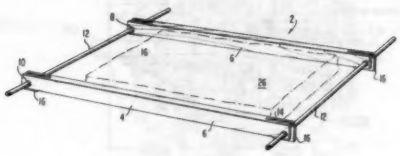
Werner Weiss, Burlington, Ontario, Canada, assignor to Sabre Saw-Chain, Ltd., Burlington, Ontario, Canada

Filed Nov. 8, 1971, Ser. No. 196,527
Int. Cl. B27b 33/14
U.S. Cl. 83—831 14 Claims



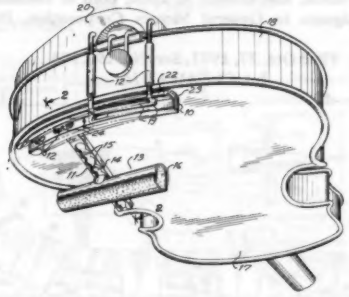
A cutter link for a saw chain having a continuous cutting edge with a leading first cutting point and a second cutting point disposed rearwardly of the first cutting point. The shank and toe portions of the cutter link are connected at their outside juncture by a concave chamfer.

3,727,508
CUTTING GUAGE FOR CAKES
Ray Haapala, Route 3, Box 76, Dassel, Minn.
Filed Dec. 10, 1971, Ser. No. 206,723
Int. Cl. A47j *43/00*
U.S. Cl. 83—859 **4 Claims**



A knock-down rectangular frame has two opposite sides with straight edges which serve as knife guides. Adjustable distance pieces at the ends of the frame sides predetermine the heights of the straight edges.

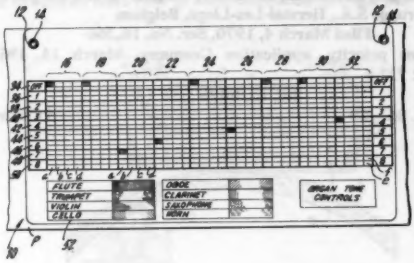
3,727,509
VIOLIN SHOULDER REST
Theodore Henkle, 5415 Reynolds Street, Savannah, Ga.
Filed July 22, 1971, Ser. No. 165,105
Int. Cl. G10d *1/02*
U.S. Cl. 84—278 **6 Claims**



A shoulder rest for violins, violas or the like, which is secured to the instrument by a clamp plate of a conventional chin rest. The shoulder rest includes a mounting plate received in secured relation between the clamp plate and the back of the instrument, an arm, a resilient shoulder rest element removably secured to the arm and formed of a semi-cylindrical sheet of material filled with a solid pad of cushion material, and means detachably connecting the arm to the mounting plate.

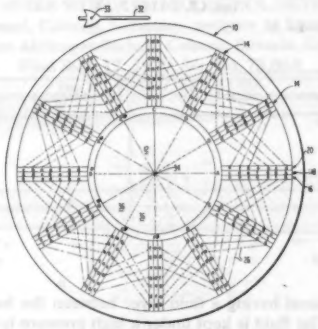
3,727,510
ORGAN TONE CONTROL
Lucine H. Cook, Sr., 10 Annette Drive, Port Washington, N.Y.
Filed April 30, 1971, Ser. No. 139,028
Int. Cl. G10b *3/10*; G09b *15/02*
U.S. Cl. 84—453 **22 Claims**

Various forms of template are provided for use in conjunction with an electronic organ, for permitting the rapid positioning of the draw bars without the need for the organist to memorize a nine-digit combination of numbers for each tonal quality. Several different embodiments of the basic concept will be described and illustrated. In one embodiment, the template having indicator thereon determines the outward position of each of the draw bars. Another embodiment of this invention provides a template having a plurality of different draw bar position combinations thereon, each of the draw bar combinations being in a distinctively different color, corresponding to the tonal quality desired by the organist. A further embodiment of the present invention provides selectively viewable light means for defining the outward position of each of the draw bars while a final embodiment of the



present invention provides a notched template that limits the outward movement of the several draw bars.

3,727,511
METHOD AND APPARATUS FOR TEACHING MUSIC CHORDS
Valeria C. Piper, 4315 Blagden Avenue N.W., Washington, D.C.
Filed Dec. 4, 1970, Ser. No. 95,075
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **3 Claims**



Apparatus for teaching music chords for educational or for use in a game, including a game board having a center area and a plurality of groups of elongated areas or channels radiating outwardly from the center area at angularly spaced locations. Each group corresponds to a different musical scale the first note of which is represented by indicia at points on the circumference of the center area adjacent the inner boundary of the group of elongated areas respectively. The number of elongated areas in each group corresponds to the number of notes in a musical chord; in the case of piano this number being three. Spaced along the elongated areas in each group are indicia corresponding to the sequential notes in each scale. A plurality of studs which may be pins or pegs are located permanently on opposite sides of each of the groups at stations corresponding to each chord. A plurality of connecting members such as rubber bands are provided for interconnecting the studs associated with adjacent groups so that the position of each of the chords may be traced throughout the different scales. Additionally, a plurality of removable studs such as pins or pegs are provided for insertion into the board in the elongated areas adjacent a note which is a sharp or a flat note in a particular chord.

3,727,512
PROCESS FOR THE SURFACE TREATMENT OF NON METALLIC CASES SUCH AS CARTRIDGES, AND THE SO TREATED CASES

Curt Berger, Sackingen, Germany, assignor to Les Forges De Zeebrugge S.A., Herstal-Les-Liege, Belgium

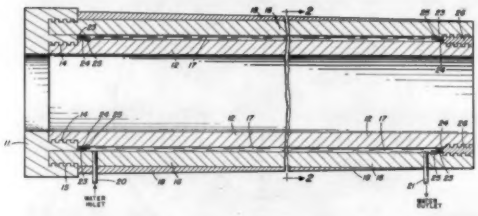
Filed March 4, 1970, Ser. No. 16,366
Claims priority, application Germany, March 13, 1969, P 19 12 727.6
Int. Cl. F42b 5/18
U.S. Cl. 86—20 5 Claims

The invention relates to a process for surface treating porous combustible cartridge cases, said process consisting in applying a first barrier layer on the outer surface of the case, and, on this layer a water impervious layer so that the case is rendered moisture- and waterproof without modification of its porous structure.

3,727,513
FLUID PRESTRESS AND COOLING TECHNIQUE FOR GUN BARREL DESIGN

Lawrence E. Wicks, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 19, 1971, Ser. No. 163,641
Int. Cl. F41f 17/14
U.S. Cl. 89—14 A 1 Claim



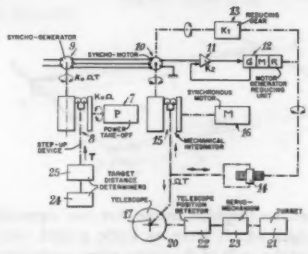
A gun barrel having a fluid layer between the barrel liner and case. The fluid is kept under a high pressure to prestress the liner. Between shots the fluid is replaced to remove the heat conducted by the liner.

3,727,514
MEANS FOR CONTROLLING THE FIRING OF A GUN AGAINST A MOVABLE TARGET

Jacques Maxime, and Rene Larribaut, both of Tarbes, France, assignors to French State, represented by the Minister of Armed Forces, Ministerial Delegation for Weapons, Technical Direction of Land Weapons Manufacturing Workshop, Tarbes, Paris, France

Filed April 17, 1969, Ser. No. 817,624
Claims priority, application France, April 25, 1968, 68149397
Int. Cl. F41g 3/06
U.S. Cl. 89—41 E 3 Claims

This invention provides a method of and a device for controlling the firing of a gun equipped with a sighting telescope which, by taking due consideration for the chief parameters, permit of introducing the correction required for firing against a moving target. This correction is obtained by moving the cross-hairs of the sighting telescope which is responsive to servo-means and adapted to travel through an angular distance equal to ΩT in the direction opposite to the pursuit direction. This value ΩT is mainly subordinate to the distance and to the speed Ω of the target which determine the gun pursuit speed and also to the time T of the shell or projectile course. The correction may be introduced according to two different methods: in the first method, the position of the

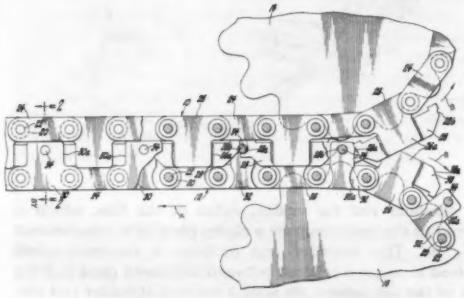


cross-hairs of the sighting telescope is acted upon continuously, and in the second method requiring the use of a fixed pair of cross-hairs and of a movable pair of cross-hairs the correction is introduced only at the last moment on the firer's will, when the pursuit is stabilized.

3,727,515
PARALLEL CHAIN DRIVE DEVICE

Harry N. Nelson, and Donald E. Peck, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1971, Ser. No. 193,105
Int. Cl. F41f 17/16
U.S. Cl. 89—47 4 Claims



A parallel chain drive device for use as a stowable ammunition rammer rod includes two stiff-backed sprocket roller chains that will flex readily when the chains are separated from each other during movement around a pair of chain drive sprockets in one direction and which interlock with each other to resist bending when moved in another direction into parallel paths of travel with respect to each other as driven and guided by the sprockets.

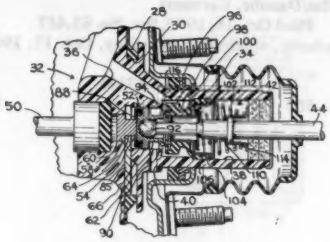
3,727,516
CUSHIONED VALVE PLUNGER

Lawrence R. Myers, and John J. Lakovits, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed June 7, 1971, Ser. No. 150,326
Int. Cl. F15b 9/10
U.S. Cl. 91—376 2 Claims

A plunger member slidably retained along an axial line in a central bore of a hub member by guiding surfaces for controlling the flow of an operational fluid. In response to an operator supplied input, the plunger member moves on the guiding surfaces in the central bore. An annular stop on the plunger member limits the movement of the plunger member

in one direction by engaging a portion of the housing of the hub member. A resilient member positively retained in the



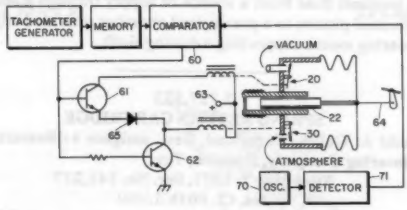
plunger member adjacent the annular stop provides a cushioning surface in which noise between the plunger member and the hub member is absorbed.

3,727,517

AUTOMATIC SPEED CONTROL

Michael Slavin, Baltimore; Raymen Forrest Emery, Lutherville; Ralph Wolf Carp, and Leoncio Tan Ang, both of Baltimore, all of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed March 3, 1971, Ser. No. 120,422
Int. Cl. F15b *9/03, 9/09*
U.S. Cl. 91—361 **6 Claims**



An automobile speed control system of the vacuum actuated type having a unitized housing embodying actuator, modulator, electronic components and inductive position feedback means. Electrical connections into the hermetically sealed expansible actuator, and noise caused by feedback potentiometer wear are eliminated. Valve means within the actuator are operated by magnetic forces generated externally to the actuator, thus eliminating electrical connections. The feedback means comprise a metallic body sealed in the actuator and movable therewith and an inductor external to the housing arranged so that its inductance will vary according to the position of the metallic body.

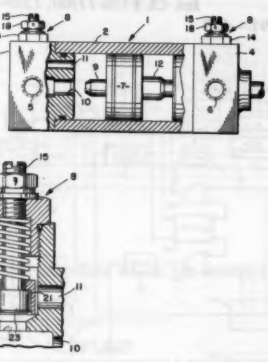
3,727,518

CHOKE-CHECK VALVE

Harley L. Gooding, Jr., Palatine, Ill., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 8, 1970, Ser. No. 96,014
Int. Cl. F15b *15/22*
U.S. Cl. 91—396 **11 Claims**

A choke-check valve for use as with a fluid motor to cushion the piston thereof as it approaches the end of its stroke characterized in that the valve has several modes of operation namely, one in which a choke adjusting member is operative to move a spring biased check valve member away from its seat to vary the flow capacity of the cushioning orifice through which fluid passes from the motor as the piston nears the end of its stroke without affecting the full flow characteristics of the check valve through which fluid passes into the motor to move the piston in the opposite direction; another in which the adjusting member moves toward the check valve seat while the check valve member is in seated position thus to define another adjustable cushioning orifice, again without affecting the pressure drop across the check valve when fluid flows into the motor; and yet another in which the adjusting member may be additionally moved toward the check valve seat to restrict fluid flow in both directions through the valve,



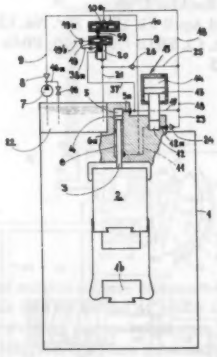
even to the extent that fluid flow through the valve is stopped whereby the valve further constitutes a shut-off valve. The valve herein is further characterized in that the size or flow capacity of the cushioning orifice may be automatically varied as the piston decelerates during the cushioning portion of its stroke.

3,727,519

HAMMER WITH A RAM CONTROL DEVICE

Harald Hassel, Coburg, Germany, assignor to Langenstein & Schemann Aktiengesellschaft, Coburg, Bavaria, Germany

Filed Sept. 17, 1970, Ser. No. 73,064
Int. Cl. F15b *15/17, 11/08*
U.S. Cl. 91—417 R **6 Claims**

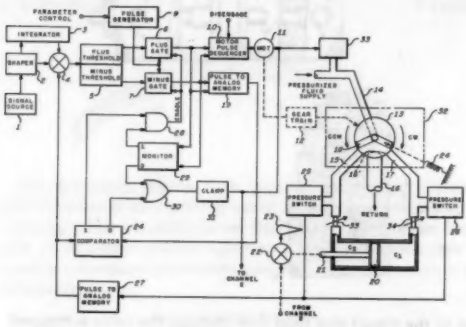


The invention relates to a hammer comprising a hydraulically operated ram and a control device for stopping the ram, comprising a piston and cylinder combination, one end of which is permanently in communication with a hydraulic fluid cavity, and the other end being in communication with said cavity through a main switching device, a pump draws liquid from a reservoir and pressurizes the cavity, as well as supplying fluid to the upper end of the cylinder through a non-return valve from the cavity, the main switching device communicating with the reservoir through a passage in which is provided an escape valve and a throttle in said passage, and a further throttle in a branch passage communicating with said first mentioned passage in front of the throttle, a switch piston occupying a cylinder behind the further throttle to control the escape valve through an actuator operated by the switch piston.

3,727,520
DIGITAL ELECTROHYDRAULIC SERVO SYSTEM

Gary C. McKown; Gerald F. Simons, and Frederick W. Lynch, all of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 6, 1970, Ser. No. 87,552
Int. Cl. F15b *11/08, 13/044*
U.S. Cl. 91—433 5 Claims

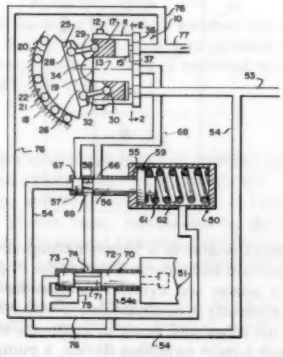


The invention comprises a single stage hydraulic control valve system having a plurality of discretely located monitoring pressure and position sensors and controlled by a digital control system through an interfacing stepper motor. The control valve system positions a controlled element in accordance with a command signal. The plurality of pressure and position sensors provide an operation check means for establishing a confidence level of the system operation.

3,727,521
ROTARY PUMP WITH DISPLACEMENT CONTROL

Richard W. Reynolds, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed April 12, 1971, Ser. No. 133,278
Int. Cl. F01b *1/00, 3/00;* F04b *1/26*
U.S. Cl. 91—475 13 Claims

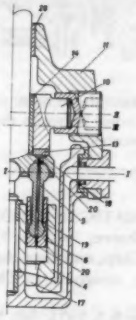


An axial piston pump including a rotary cylinder block with reciprocable pistons controlled by an adjustable swashplate for varying displacement as the cylinder block rotates against a valve plate, together with a control port in the valve plate for supplying fluid under pressure to the pumping pistons for controlling the position of the swashplate and therefore the displacement through the medium of the pumping pistons rather than separate control means.

3,727,522
HYDRAULIC MACHINES

Dieter Weigle, Ulm/Danube, Germany, assignor to Constantin Rauch, Ulm/Danube, Germany

Filed Oct. 16, 1970, Ser. No. 81,457
Claims priority, application Germany, Oct. 17, 1969, P 19 52 472.2
Int. Cl. F01b *13/06*
U.S. Cl. 91—505 9 Claims

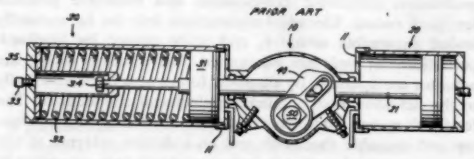


A hydraulic machine constructed and arranged to be driven and transmit fluid from a source of supply through a series of perforated pistons to a pressurized chamber provided adjacent to bearing means supporting a driving shaft.

3,727,523
SPRING RETURN CARTRIDGE

Ronald A. Gulick, Sugarland, Tex., assignor to Research Engineering Company, Houston, Tex.

Filed May 7, 1971, Ser. No. 141,217
Int. Cl. F01b *31/00*
U.S. Cl. 92—130 3 Claims



An actuator of the type having a spring return portion, wherein the cylinder containing the spring forms a cartridge interchangeable on the housing with other cartridges, and the cartridge is so constructed as to negate the need for venting to atmosphere.

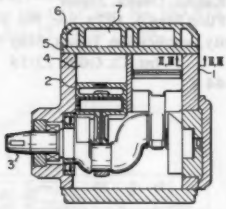
3,727,524
GAS COMPRESSOR

Keizo Nishiyama, Handa; Hikaru Takaoka, and Shozo Nakayama, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya-shi, Japan

Filed Aug. 4, 1971, Ser. No. 168,982
Claims priority, application Japan, Aug. 8, 1970, 45/69387
Int. Cl. F01b *11/02*
U.S. Cl. 92—169 3 Claims

A gas compressor of high wear-resistance comprising at least one set of a piston and a cylinder, preferably a ringless piston and a sleeveless cylinder, which are composed of an Al-

Si alloy mainly containing eutectic crystals, preferably the piston being composed of a hyper eutectic crystals of an Al-Si



alloy, the inside wall surface of the cylinder being formed of a chill structure layer.

3,727,525

DEVICE FOR MAKING PHOSPHOR SCREEN FOR COLOR PICTURE TUBES

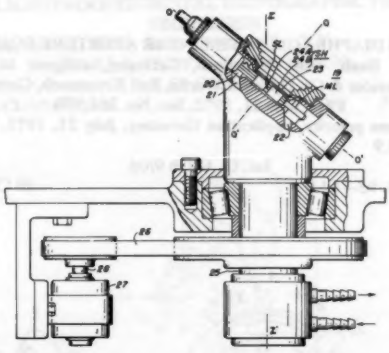
Jiro Degawa, 6-301 Makuhari-cho, Chiba, and Osamu Takeuchi, 14-8 Tama-daira 2, Tokyo, both of Japan

Continuation-in-part of Ser. No. 836,871, June 26, 1969, Pat. No. 3,593,056. This application April 8, 1971, Ser. No. 132,331

Claims priority, application Japan, June 29, 1968, 43/45376

Int. Cl. G03

U.S. Cl. 95—1 R **11 Claims**



A novel mercury-arc lamp which is partly shielded so as to provide a point source of light for use with a make for producing color phosphor screens of color television picture tubes is disclosed. Various embodiments disclose different means for shielding the ends of the mercury-arc lamp. In addition, an apparatus for cooling the mercury-arc lamp is disclosed.

3,727,526

PHOTOGRAPHIC EXPOSURE CONTROL ARRANGEMENT

David Hinds, Yorkshire, England, assignor to Vickers Limited, London, England

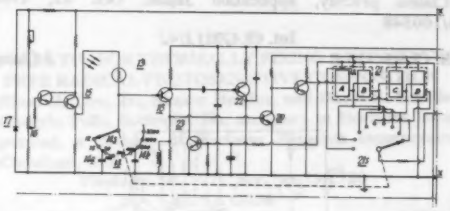
Filed Feb. 11, 1970, Ser. No. 10,394

Claims priority, application Great Britain, Feb. 11, 1969, 7,440/69

Int. Cl. G03b 7/08

U.S. Cl. 95—10 CT **13 Claims**

A photographic exposure control arrangement in which pulses are produced by the repeated charge and discharge of a capacitor in dependence upon the light intensity and an electromagnetic shutter is held open for the duration of a predetermined number of pulses which are counted by a binary counter.



3,727,527

PHOTOGRAPHIC APPARATUS WITH LIQUID CRYSTAL VOLTAGE INDICATOR

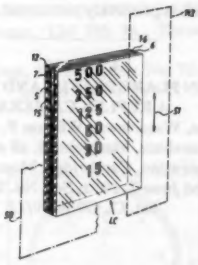
Kurt Borowski, Munich, and Alfred Kubitzek, Munich Solln, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 8, 1972, Ser. No. 261,038

Claims priority, application Germany, June 11, 1971, P 21 28 992.9

Int. Cl. G01j 1/42

U.S. Cl. 95—10 R **10 Claims**

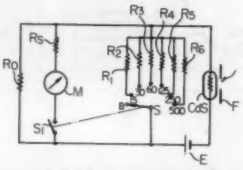


A still camera or motion picture camera wherein the exposure control circuit has an output at which the voltage is indicative of the prevailing scene brightness, of the selected aperture size, the selected exposure time and/or the sensitivity of film with which the camera is loaded. The output is connected with one electrode of a liquid crystal cell which is associated with a suitable scale to indicate the voltage at the output. If the voltage at the output is indicative of the aperture size, film speed and/or scene brightness, a reading of the scale (which is preferably observable by looking into the view finder) enables the user of the camera to properly select the exposure time. If the voltage at the output is indicative of the selected exposure time, film speed and/or scene brightness, the user can read the scale to properly adjust the aperture size. One of the two transparent electrodes in the liquid crystal cell may be of sinusoidal shape to further facilitate the determination of boundary between the transparent and non-transparent or differently colored portions of the liquid layer between the electrodes; such boundary travels in dependency on changes of voltage at the output.

3,727,528
PHOTOGRAPHIC CAMERA HAVING AUTOMATIC EXPOSURE CONTROL

Masanobu Sato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1970, Ser. No. 82,307
Claims priority, application Japan, Oct. 22, 1969, 44/100548
Int. Cl. G01j 1/42
U.S. Cl. 95—10 C 3 Claims

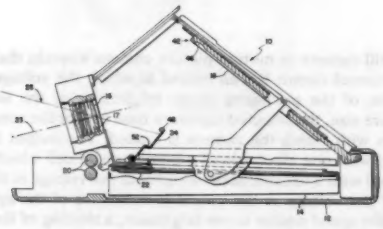


Photographic camera having automatic exposure control of the type in which the shutter speed is selected by the operator, the operation of the shutter release being prevented when the scene brightness is excessive or insufficient for proper exposure at the selected shutter speed. The electric circuit of the camera consists of a photoelectric element, a galvanometer and a plurality of resistors each having a resistance corresponding to a shutter speed and selectively connected to the circuit in coupled relationship to the setting of the shutter speed to compensate for the indication of the galvanometer for proper exposure in accordance with the set shutter speed. The galvanometer is short-circuited or deenergized upon the setting of the shutter to the "bull" position or B-speed at which the shutter blades are kept opened upon actuation of the shutter release until the shutter is released thereby permitting the galvanometer to indicate the condition as if the intensity of light were insufficient for the proper exposure so that false exposure is positively prevented.

3,727,529
COMBINATION FLARE BAFFLE AND LIGHT SEAL FOR A REFLEX CAMERA

Charles De Jesus, Watertown; William P. Lane, Taunton, and Richard R. Wareham, Marblehead, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 7, 1971, Ser. No. 150,675
Int. Cl. G03b 19/12
U.S. Cl. 95—42 19 Claims

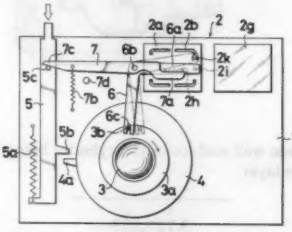


A movable baffle inside a relfex camera protects a film unit therein from stray light during a photographic exposure and helps prevent fogging of film units stored within the camera during focusing or storage by forming a labyrinth seal with a capping plate. The capping plate is movable so as to cover the film unit during focusing and storage, and includes guide means on its underside to control the movement of the baffle to its labyrinth seal position. The invention is especially suited for use in a folding single lens reflex camera.

3,727,530
DEVICE FOR SETTING FOCUSING DISTANCE IN CAMERA

Koichi Aoki, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 4, 1971, Ser. No. 140,076
Claims priority, application Japan, May 9, 1970, 45/45411
Int. Cl. G03b 13/18
U.S. Cl. 95—44 R 9 Claims

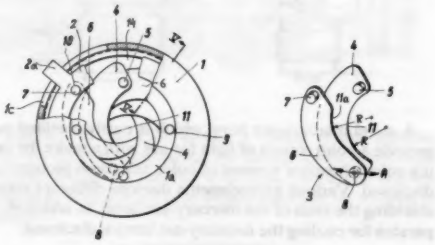


A slit is formed in a viewfinder frame plate and an optical system projects approximately at the center of the finder field a an image of the slit having a definite length. By the coincidence of the slit image with the image in the finder field of a subject having a foreknown size, the camera can be set for the focusing distance. The optical system for producing the slit image includes a masking member movable across the slit image light path to permit the slit image to appear or disappear in operative relation with the focusing movement of the lens.

3,727,531
IRIS DIAPHRAGM WITH LINEAR APERTURE SCALE

Albert Baab, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Germany

Filed June 21, 1972, Ser. No. 264,770
Claims priority, application Germany, July 21, 1971, P 21 36 343.9
Int. Cl. G03b 9/06
U.S. Cl. 95—64 R 10 Claims

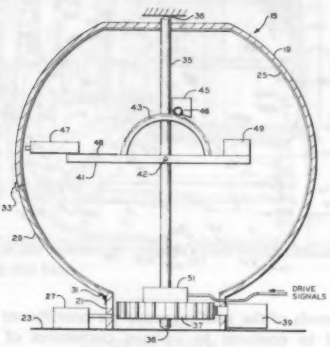


An iris diaphragm provided with a fixed mounting ring and a rotatable setting ring coplanar therewith has a multiplicity of angularly equispaced iris-leaf pairs each including a main leaf and an ancillary leaf articulated to each other at one end, the free opposite ends of the two leaves being respectively fulcrumed on the mounting ring and on the setting ring confronting the same side of the leaves. The generally crescent-shaped ancillary leaf has an arcuate inner edge with a radius of curvature substantially corresponding to the maximum radius of the diaphragm aperture; the main leaf may be of similar configuration of may have a generally elbow-shaped contour.

3,727,532
SPHERICAL CAMERA MODEL SYSTEM

Gerald A. Gregory, Binghamton, N.Y., assignor to Singer Company, New York, N.Y.

Filed May 10, 1971, Ser. No. 141,871
Int. Cl. G03b 17/56
U.S. Cl. 95—86 8 Claims

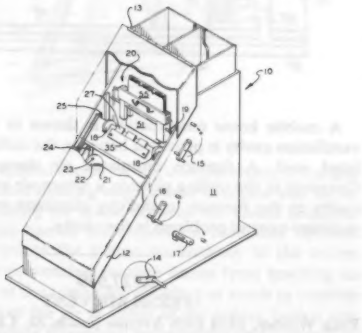


A TV camera mounted on a support structure within a spherical shell to provide video signals for display. The support structure is rotatable and the camera is movably mounted thereon. Air can be applied to the interior of the shell to press a sheet of flexible material including display data against the surface of the shell.

3,727,533
LIGHTPROOFED DENTAL RADIOGRAPHIC FILM DEVELOPER

Theodore Perl, 58 Ely Drive, Fayetteville, N.Y.

Filed July 20, 1971, Ser. No. 164,270
Int. Cl. G03d 3/10
U.S. Cl. 95—89 R 5 Claims

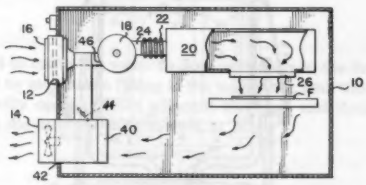


A small X-ray film developer has a lightproof housing having a door through which a plurality of exposed films in their lightproof wrappers may be introduced by sliding the wrapper flaps over the thin edge of a plate adapted to slide toward and away from an identification card holder which is adapted to be rotated and to be raised and lowered. After the card and films have been introduced the door is closed and a rod under the flaps is rotated about 135° around the plate to open the wrapper flaps exposing a small portion of each film so that each may be contacted by gummy portions on the card when it is turned. The plate is then slid away from the card thus withdrawing the films and the card is turned and lowered dipping the films into a developing tank. Valves controlling sources of developer, fixer and water are then operated to supply the tank successively therewith. The card is then raised and a fan is turned on to dry the developed films. The door is then opened and the card with attached developed films is removed. A film cover with appropriate windows for the films is then attached to the card leaving its identifying inscriptions and the films readable.

3,727,534
APPARATUS FOR THERMALLY FIXING A NON-SILVER FREE RADICAL PHOTOSENSITIVE COMPOSITION

William H. Low, Jr., Shaker Heights, and David R. Schaller, Chagrin Falls, both of Ohio, assignors to Horizons Incorporated, a Division of Horizons Research Incorporated, Cleveland, Ohio

Filed Oct. 20, 1971, Ser. No. 190,720
Int. Cl. G03d
U.S. Cl. 95—89 R 2 Claims

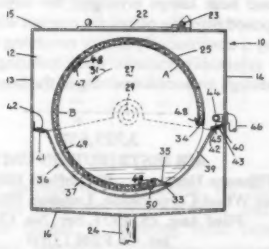


The heat fixing of non-silver free radical films is effected by blowing heated air directly at the film so that the air strikes the film approximately perpendicular to the film surface and a turbulence is created in the air adjacent to the film and the apparatus for effecting the same.

3,727,535
PHOTOGRAPHIC PROCESSING APPARATUS

Robert G. H. Streeter, 124 8th St., Toronto 14, Ontario, Canada

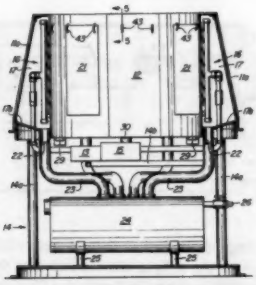
Filed Sept. 25, 1970, Ser. No. 75,605
Int. Cl. G03d 3/06
U.S. Cl. 95—93 13 Claims



Apparatus for processing photographic materials such as film or paper prints. The apparatus comprises: an elongated horizontal housing having a top wall provided with an access opening sealed by a lid, a horizontal cylindrical drum mounted in the housing for rotation on its longitudinal axis, a solution tray pivotally mounted in the housing below and drum for movement between an operative position and a dumping position for discharging spent solution, and a distribution pipe for supplying treatment solution to the tray. The drum is provided with an opening in its periphery having two parallel rims extending along the longitudinal axis of the drum and a scooping lip mounted on one of the said rims. The sheets of photographic material are placed in the drum through the opening and the sheets are secured inside the drum by adjustable bars detachably fixed on the inside periphery of the drum. The

drum is then continuously rotated about its horizontal axis and a predetermined amount of treatment solution fed into the tray. As the drum rotates the scooping lip scoops up the solution into the drum so that the photographic sheets are continuously brought into contact with the solution. The tray is then tilted to discharge the solution and a succession of treatment solutions are fed into the tray in the foregoing manner until the photographic sheets are processed.

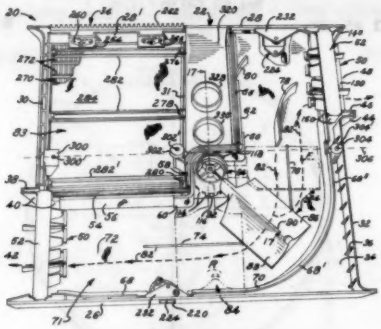
3,727,536
EXPOSED PRINTING PLATE WASHER
Richard D. Bunker, Salt Lake City, Utah, assignor to Dyna-Flex Corporation, Salt Lake City, Utah
Filed Jan. 3, 1973, Ser. No. 214,736
Int. Cl. G03d *3/10*
U.S. Cl. 95—98 **5 Claims**



An apparatus for washing away water soluble areas of a plastic emulsion covering a plate used in printing operations. Portions of the normally water soluble plastic emulsion become insoluble in water when exposed to ultra violet light through a light dark master. The apparatus consists of a housing wherein circulating heated water is sprayed uniformly over the printing plate by an arrangement of nozzles to remove the portions of the plastic emulsion remaining water soluble. The nozzles uniformly wash all areas of the emulsion coating, developing thereon, in plastic relief, a representation of the light dark master. The housing of the apparatus also contains air jets and heat lamps arranged for drying the developed plate. Exposed printing plates are carried within the apparatus housing by a continuously slowly revolving drum to which an operator releasably mounts each printing plate by spring clamps through an access opening in the housing.

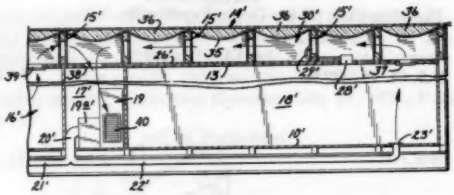
3,727,537
AIR DISTRIBUTION UNIT
Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Aug. 25, 1971, Ser. No. 174,619
Int. Cl. F24f *13/00*
U.S. Cl. 98—32 **26 Claims**

An air distribution unit for use with an air conditioner for a motor or mobile home, travel trailer or the like wherein the air conditioner is mounted exteriorly on the roof and warm air is drawn from the space to be cooled through the ceiling into the air conditioner and then returned via a cool air supply duct to cool the space. The unit comprises a shroud having front, rear and side walls and an open upper end adapted for flush mounting against the ceiling. An S-shaped cool air distribution passageway extends within the shroud which registers with the outlet of the cool air supply duct leading from the air conditioner. An air deflector is movably disposed in said air distribution passageway to variably apportion the cool air between front and rear cooled air discharge outlets which in turn are controlled by multiple vane louver means adjustable about two axes. Lateral distribution of cool air is obtained through adjustable vane side outlets. The shroud includes a warm air return passageway which is isolated by internal partitions from the distribution passageway. The warm air intake is covered by a perforate, hinged grill which is readily removable for cleaning. The shroud also provides recessed mounting for



the controls of the roof-mounted air conditioner unit, and is adapted to conform to various curvatures of the ceiling mounting surface through a center-line mounting arrangement.

3,727,538
HEATING AND VENTILATING SYSTEM FOR MOBILE HOMES
Dean Jacobson, Jr., 420 East Vernon, Fergus Falls, Minn.
Filed Sept. 15, 1971, Ser. No. 180,691
Int. Cl. F24f *13/00*
U.S. Cl. 98—33 **4 Claims**

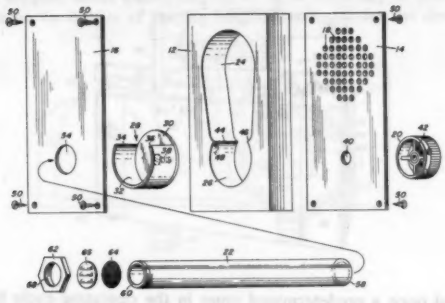


A mobile home construction is shown in which a forced ventilation cavity is provided between the ceiling and an insulated roof. A furnace circulates air through the rooms. Openings in the ceiling provide a return air path through the cavity to the furnace to thereby eliminate temperature and moisture control problems in the cavity.

3,727,539
FRESH AIR VENT
Fran Wilmes, 1524 14th Avenue South, St. Cloud, Minn.
Filed July 2, 1971, Ser. No. 159,271
Int. Cl. F24f *13/08*
U.S. Cl. 98—41 **6 Claims**

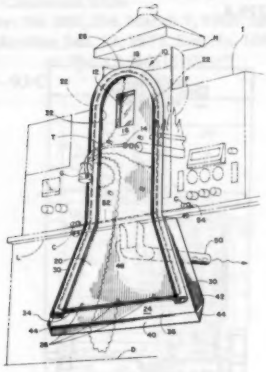
A fresh air vent designed to allow fresh air to flow into a house at a controlled rate is disclosed. The vent consists of a rectangular box which can be inserted in or mounted on the interior surface of the wall of a room of the house, with the front panel of the vent being provided with an opening, which may be in the form of a plurality of small vent holes, which allows air to flow from the interior of the device into the room. On the back surface of the box there is located an opening which is adapted to receive the end of an air inlet tube, the tube extending through the exterior wall of the building to admit air into the vent box. A control valve is located within the box between the inlet and outlet openings, the valve being

adjustable to regulate the flow of air through the box. This control valve is in the form of a slidable gate which may be



moved across the opening to permit exact regulation of the air flow through the box.

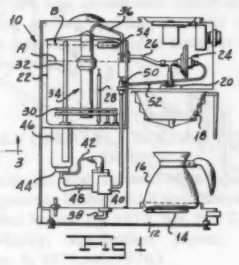
3,727,540
FUME BARRIER
Vincent Galluzzo, 120 Gibbons Boulevard, Cockeysville, Md.
Filed Aug. 6, 1971, Ser. No. 169,621
Int. Cl. F23j *11/12*
U.S. Cl. 98—115 LH **9 Claims**



Two parallel-spaced sheets having complementarily flanged peripheral portions forming edge intake structure and an air pump for exhausting the space between the sheets comprise an open-air fume barrier for disposition broadside between two points to isolate the points ventilatively to the extent necessary, as in preventing gasoline fumes from reaching an open flame but at the same time avoiding as much as possible any disturbance of the air at either of the points; both a specially shaped upright laboratory embodiment and a circularly symmetrical gasoline dispenser model are disclosed.

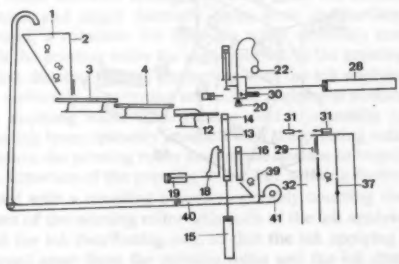
3,727,541
HOT WATER SUPPLY SYSTEM FOR BREWER
Harvey R. Krueger, Carpentersville, Ill., assignor to Reynolds Products, Inc., Schaumburg, Ill.
Filed June 7, 1971, Ser. No. 150,282
Int. Cl. A47j *31/00*
U.S. Cl. 99—307 **6 Claims**

A system for supplying hot water to the brewing chamber of a coffee brewer or the like in which a charge of cold water approximating the amount of beverage to be brewed is introduced into a hot water tank adapted normally to contain hot water to a predetermined level through the top of a vertically extending pipe in the tank having a diametral enlargement in the region of said level to discharge the cold water adjacent to a heater in the lower portion of the tank thus to displace a corresponding amount of hot water upwardly above



said level to cause hot water to flow outwardly to the brewing chamber by means of a fitting in the wall of the tank through a downwardly opening inlet adjacent the level and through a screen in the fitting above the level.

3,727,542
INSTALLATION FOR TRIMMING MUSHROOMS AND OTHER VEGETABLES
Maurice Blanchaud, and Edgard Bournier, both of (Maine et Loire) Chace, France
Filed Oct. 15, 1970, Ser. No. 80,837
Claims priority, application France, Oct. 20, 1969, 6935893; May 5, 1970, 7019635; June 16, 1969, 7022169; Sept. 28, 1969, 035041
Int. Cl. A23n *15/04;* **B26d** *3/00*
U.S. Cl. 99—637 **9 Claims**

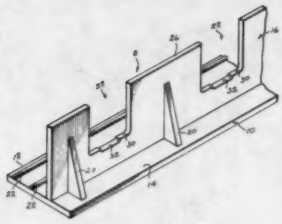


This invention relates to a machine for cutting up mushrooms, first the roots and then the stem, this machine comprising a feed funnel, a vibrating table bringing the mushrooms in lines, feet first, to gripping components, the latter taking the mushrooms and bringing them above the cutting components, the different mushroom pieces being distributed separately into recuperation ducts.

3,727,543
RAIL FOR USE IN STRAPPING LOADS OF MULTIPLE PARTS
Jack H. Morrow, and James A. McCarthy, both of South Bend, Ind., assignors to Rowland L. Sylvester, South Bend, Ind., by said James A. McCarthy
Filed Dec. 30, 1971, Ser. No. 213,893
Int. Cl. B65b *13/00, 13/18*
U.S. Cl. 100—1 **7 Claims**

A rail for use in strapping together multiple parts assembled upon skids to produce a packaged unit. The rail is a rigid member having an elongated base and a single side wall pro-

jecting upwardly from the base and spaced from one longitudinal edge of the base. The base and side wall each define



grooves or cut-outs which receive the skids and straps by which the load is packaged into a unit.

3,727,544

METHOD AND MEANS FOR SECURING SHELVES AND THE LIKE SUPPORTS BETWEEN TWO WALLS

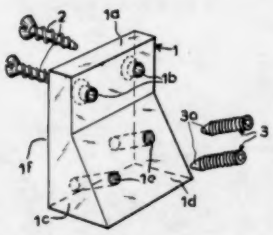
Pierre Devillard, 19 rue Saint Joseph, Saint-Etienne, France

Filed March 9, 1971, Ser. No. 122,447

Claims priority, application France, March 10, 1970, 7008612

Int. Cl. A47b *23/04*

U.S. Cl. 108—42 **5 Claims**



A method and means for securing shelves, racks and the like supports between two walls by means of cleats, each cleat including two sections rigid with each other, the upper, preferably flat section being screwed to the edge of the corresponding end of the shelf while the lower section is screwed to the cooperating wall. Said lower section has advantageously a downwardly flaring surface facing the location of the shelf and the screws securing it to the wall engage the latter in a preferably downwardly sloping direction so as to transmit to the wall the components of the load carried by the shelf.

3,727,545

PRESS WITH SEMI-AUTOMATIC CYCLE

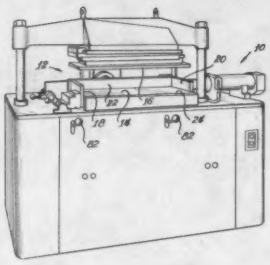
Ditlev P. Madsen, Palos Park, and Norman Rybicki, Chicago, both of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed July 26, 1971, Ser. No. 166,087

Int. Cl. B30b *15/14*

U.S. Cl. 100—53 **6 Claims**

In a press of the type comprising a plurality of platens arranged for relative movement in orthogonal directions, an improvement whereby the press remains in operation, once operation of the press has been initiated by a starting switch



and once a predetermined point in the operating cycle has been reached, after the starting switch has been opened.

3,727,546

GARBAGE COMPACTOR

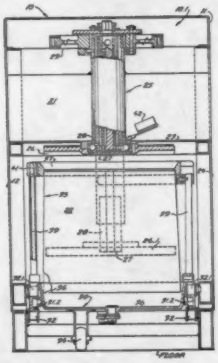
John J. McKinney, South Burnaby, British Columbia, Canada, assignor to MCW Holdings Ltd., Vancouver, British Columbia, Canada

Filed Feb. 25, 1971, Ser. No. 118,918

Claims priority, application Great Britain, Oct. 7, 1970, 47,603/70

Int. Cl. B30b *15/06*

U.S. Cl. 100—229 A **3 Claims**



A garbage compactor having an upwardly tapered stainless steel garbage receiving sleeve on which a garbage bag can be slidably fitted and a pressure plate movable axially of the sleeve for compressing garbage against the garbage bag bottom which is supported by a platform located below the sleeve. The sleeve protects sides of the bag from damage which, otherwise, might rip in compacting sharp cornered objects.

3,727,547

SELF-ADJUSTING CODING APPARATUS

Sheldon L. Wilde, Crawfordsville, Ind., assignor to H-C Industries, Incorporated, Crawfordsville, Ind.

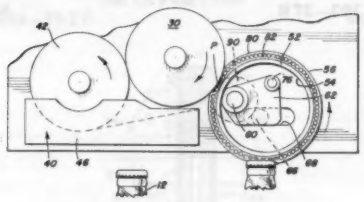
Filed June 17, 1971, Ser. No. 154,083

Int. Cl. B41f *17/16*

U.S. Cl. 101—35 **10 Claims**

Marking apparatus for applying indicia to capped bottles or other containers of varying heights. The device consists of a rim having a print ring on the outer perpheral surface held in frictional engagement with a drive wheel that also performs a function of supplying ink to the print ring and is maintained in

frictional engagement through a smaller diameter wheel engaging the inner surface of the rim. A substantial point contact between the inner surface of the rim and the outer surface of the support wheel allows the rim to move vertically to compensate for bottles of varying heights passing under the rim.



While not necessary to the practice of the invention, an idler roller may engage the inner surface of the rim at the location spaced from the contact with the second wheel to provide additional support for the rim during its normal rotational movement.

3,727,548

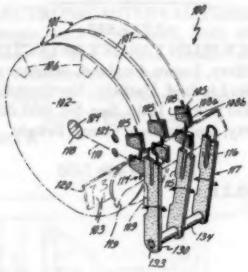
PRINT HAMMER WITH INTEGRAL PIVOTAL PRINT ANVIL

Vernon T. Kleimeyer, and Thomas J. Schinner, both of Cincinnati, Ohio, assignors to The Cincinnati Time Recorder Company, Inc., Cincinnati, Ohio

Division of Ser. No. 805,284, March 7, 1969, abandoned. This application Jan. 13, 1971, Ser. No. 106,227

Int. Cl. B41j 9/02

U.S. Cl. 101—93 C **1 Claim**



The printer includes a plurality of print wheels coaxially mounted for rotation about a common shaft and each including a metal disc provided with circumferentially spaced, embossed character bearing print members located at the disc periphery, and a plurality of pivotally mounted print hammers each having an anvil with a hammer surface which is selectively urgeable against its associated embossed character to produce at a print station, a character imprint on a record medium interposed along with a carbon ribbon between the hammer and the print wheel. One form of hammer includes an anvil which is pivotally mounted to the hammer body for the purpose of automatically compensating, every imprinting cycle, for nonparallelism between the hammer surface of the anvil and the plane of the embossed character at the point where they engage in imprinting relationship. Another form of hammer includes an anvil whose orientation can be selectively and permanently adjusted to eliminate nonparallelism between the hammer surface and a given character plane. Adjustment is accomplished by plastically deforming a wire which controls the orientation of the anvil relative to the hammer body. A method of fabricating the print wheels is disclosed which includes a placing holes at the center of the disc as well as at index points associated with the print member receiving positions whereat the print members are formed; mounted the disc in a molding device having a center post, an index post and a print member forming, or molding, cavity with the center and index posts engaging the center hole and an index hole, respectively, and with the print member receiving position of the disc positioned within the molding cavity; and introducing molten molding material into the cavity to form the print member at the print member receiving position inserting within the cavity.

3,727,549

MANUALLY OPERABLE ROLLER TYPE PRINTING DEVICE

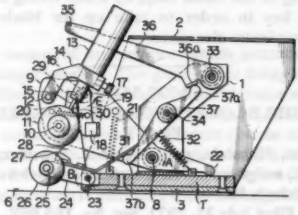
Toshimi Kumakura, and Takashi Hosoyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Itoya, Tokyo, Japan

Filed March 15, 1972, Ser. No. 234,784

Claims priority, application Japan, July 29, 1971, 46/57086; Dec. 9, 1971, 46/99763

Int. Cl. B41f 31/30, 17/26

U.S. Cl. 101—330 **5 Claims**



The manually operable roller type printing device has a body frame adapted to be slidably moved on the surface to be printed, and the body frame mounts therein a rotatable printing roller movable toward and away from the surface to be printed and urged normally away from the surface to be printed, a rotatable ink applying roller rotatably contacting with the printing roller for supplying ink to the printing roller, an ink distributing pad contacting with the ink applying roller for uniformly distributing ink on the peripheral surface of the ink applying roller as it rotates, and a manually operable pressing lever operably coupled with the printing roller so as to move the printing roller toward the surface to be printed by the actuation of the pressing lever. The printing device is provided with a coupling member operably coupling the movement of the printing roller with each of the ink applying roller and the ink distributing pad, so that the ink applying roller is moved apart from the printing roller and the ink distributing pad is moved apart from the ink applying roller when the printing roller is moved away from the surface to be printed.

3,727,550

ADJUSTING ARRANGEMENT FOR INK FOUNTAIN IN PRINTING PRESS

Robert D. Easoz, Woodridge, and Nelson M. Robinson, Lombard, both of Ill., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

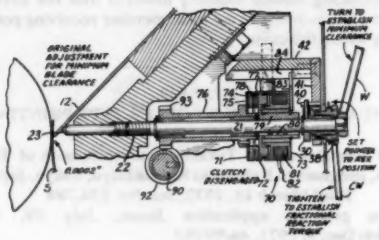
Filed Sept. 13, 1971, Ser. No. 180,021

Int. Cl. B41f 31/04

U.S. Cl. 101—365 **5 Claims**

An arrangement for adjusting the blade in an ink fountain which includes a set of rotatable keys, each of the keys carrying a frictionally engaged radial stop cooperating with a fixed stop to limit the angle of the adjusting movement of the key. A tool fitting is provided at the outer end of each key for manually rotating the key, with the stops in engagement, to adjust minimum blade clearance. A frictionally engaged pointer coupled to the key, is settable in accordance with the position of the radial stop to provide constant visual indication

of the key adjustment. Each key has an electric friction type clutch for coupling the key to a rotatable shaft to provide running adjustment of running film thickness. The friction connection between the radial stop and the key is set to permit


ORIGINAL ADJUSTMENT FOR MINIMUM BLADE CLEARANCE
TURN TO ESTABLISH MINIMUM CLEARANCE
SET POINTER TO ARC POSITION
CLUTCH DISENGAGED
TIGHTEN TO ESTABLISH FRICTIONAL REACTION TORQUE
CW

manual overpowering of the connection, and hence a change in the phasing of the radial stop, by a tool fitting on the outer end of the key in order to take up for blade wear and reestablish minimum clearance.

3,727,551

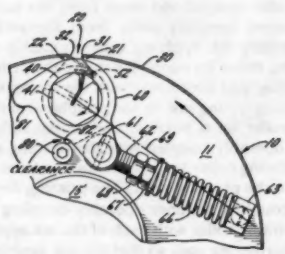
REVERSIBLE LOCKUP FOR FLEXIBLE PRINTING PLATE

Evans Kostas, Hinsdale, and Robert E. Schwarz, Rockford, both of Ill., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed July 22, 1971, Ser. No. 165,068

Int. Cl. B41f 27/12

U.S. Cl. 101—415.1 **4 Claims**



A lockup for securing a flexible printing plate to a reversibly driven plate cylinder in which the leading end of the plate may be held in a reference position and in which the trailing end of the plate may be kept under constant tension regardless of the direction of cylinder rotation. A longitudinal groove is formed in the cylinder having undercut edges with a rockable shaft being mounted in the groove having a gripper extending longitudinally of the shaft and presenting gripping edges facing in opposite directions. An overcenter spring toggle detents the shaft in two positions in which the gripper lies on one side or the other of the center of the groove, manual throw-over means being provided for throwing the shaft between its detented positions so that, when a first end of the plate is hooked over one of the undercut edges and the second end of the plate is placed in the path of movement of the gripper, manual throw-over causes the gripper to swing into gripping engagement with the second end of the plate to keep the plate under constant tension on the cylinder. In the preferred embodiment the gripper is in the form of a leaf spring partially recessed in the shaft and symmetrical stops are provided for limiting rocking movement of the shaft in both directions.

3,727,552

BIDIRECTIONAL DELAY CONNECTOR

Howard Zakheim, New York, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 4, 1971, Ser. No. 150,092

Int. Cl. F42b 3/16

U.S. Cl. 102—27 R **9 Claims**

Bidirectional delay connectors for detonating fuse having a shell containing two detonating explosive charges, each end of the shell adjacent the detonating charges adapted to receive detonating fuse, heat-sensitive charges adjacent each detonating charge and in close proximity to exothermic charges in opposite ends of a metal relay capsule. A heat conductive metallic delay element is positioned between each heat-sensitive charge and said relay capsule containing exothermic charges.

3,727,553

FUZE DEVICE WITH TARGET DETECTING MEANS

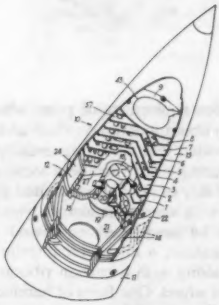
Peter Brian Godfrey, Luton, England, assignor to Hawker Siddeley Dynamics Limited, Hatfield, Hertfordshire, England

Filed Dec. 6, 1966, Ser. No. 600,005

Claims priority, application Great Britain, Dec. 6, 1965, 51,717/65

Int. Cl. F42b 5/08

U.S. Cl. 102—70.2 P **2 Claims**

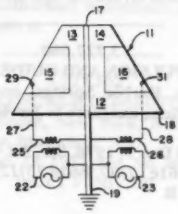


A fuse device capable of producing a signal in proximity to a target in response to changes in infra-red radiation due to the presence of the target, the device having a single field of view, a device responsive to radiation in said field of view to produce corresponding electrical signals, optical means interposed between said device and said field of view and operable to discriminate against radiation outside a selected range of wavelengths and electronic means supplied with said electrical signals and having a frequency band-pass selected to reject signals having a frequency below a selected value corresponding to a selected minimum rise-time of the signals.

3,727,554
SPLIT ANTENNA FOR DUAL CHANNEL FUZE

Alden Packard, Little Rock, Ark., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 15, 1956, Ser. No. 622,509
Int. Cl. F42l *13/00*
U.S. Cl. 102—70.2 P **4 Claims**

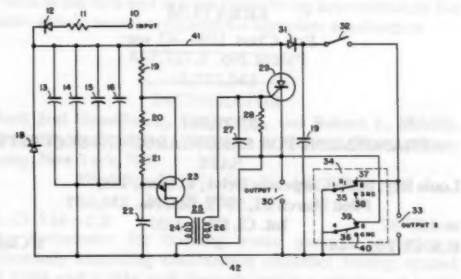


An antenna cap for a dual channel transceiver mounted in a proximity fuze comprising a segmented frusto-conical member composed of insulating material, a pair of electromagnetic excitable elements separately secured on the conical surface of said member, a point of common potential in said fuze, a conducting shield plate inserted within said material between said electromagnetic elements and electrically connected to said point of common potential, two separate transceivers operating on different frequencies and independently of each other, each of said transceivers electrically connected to a respective one of said electromagnetic elements and to said point of common potential, whereby the signal transmitted from one of the channels is isolated from the signal transmitted from the other channel.

3,727,555
ELECTRONIC INTERVAL TIMER

Paul J. Rainsberger, and Irwin Koff, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 28, 1969, Ser. No. 823,237
Int. Cl. F42c *11/06*
U.S. Cl. 102—70.2 R **1 Claim**



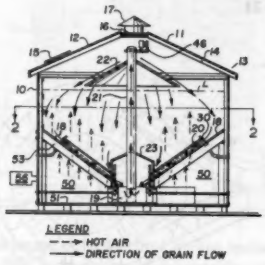
An electronic interval timer for delaying ignition of the rocket motor after ejection of a weapon from an aircraft for providing a safe interval for weapon separation.

3,727,556
GRAIN DRYER

Arnold L. Adams, 1944 Saint George Avenue, Saskatoon, Saskatchewan, Canada

Filed April 21, 1971, Ser. No. 136,117
Claims priority, application Canada, Aug. 7, 1970, 090213
Int. Cl. F26b *25/00*
U.S. Cl. 34—102 **12 Claims**

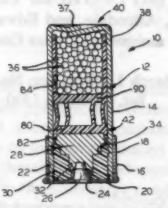
The grain dryer disclosed herein is designed to eliminate the tendency of certain portions of the grain, particularly damp portions, to become lodged within the dryer thereby to give every kernel of grain an equal opportunity to come into contact with the drying regions of the dryer. For this purpose the dryer is provided with specially designed return channels and ports which act to regulate and ensure a continuous flow of grain entering the dryer mixing chamber where all the grain has an opportunity to be mixed together and thereafter elevated by means of an elevator which extends upwardly from the mixing chamber. The grain, after being elevated, is discharged adjacent the upper end of the elevator and allowed to spill outwardly over the grain. The return channels cause the grain to continually take a different course each time it passes over or through the drying regions of the dryer. Provision is made for heated air to pass through the dryer return channels thus assisting in effecting rapid drying of the grain.



3,727,557
WAD FOR SHOTGUN SHELLS

Samuel Starcevich, 306 Mills Road, Joliet, Ill.

Filed Oct. 21, 1971, Ser. No. 191,382
Int. Cl. F42b *7/08*
U.S. Cl. 102—95 **3 Claims**



A shotgun shell wad in the form of a one piece structure formed from polyethylene or the like including an obturating disc or cup and a shot cup or protector in spaced apart relation axially of the shell in which the side wall of the cup is segmented petal fashion; a shock absorbing filler connects the disc and cup in the form of pairs of angled struts on either side of the axis of the shell, with the struts of each pair being respectively parallelly angled inwardly of the shell axis to define folding apexes therein, and with such folding axes being spaced apart axially of the shell, whereby on firing of the shell in which the wad is placed, such struts fold free of interference with each other in cushioning the accelerating forces acting on the shot and recoil acting on the gun. The connection of the struts to the cup is such that the folding action of the struts arcs the floor of the cup to fling wide open the cup petals when the wad leaves the gun muzzle, making for quick drop away of the wad from flight.

3,727,558

TRANSPORT SYSTEM WITH MOVING-PLATFORM TERMINAL

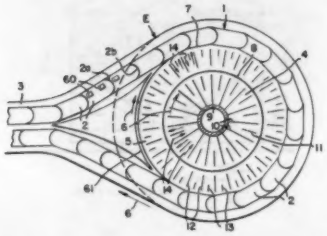
Gunther Winkle, Munich, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Oct. 5, 1970, Ser. No. 77,897

Claims priority, application Germany, Oct. 4, 1969, P 19 50 109.8

Int. Cl. B61k *1/00*

U.S. Cl. 104—21 **13 Claims**



A transport system of the continuously-operable, endless type has a succession of interconnected transport vehicles in an endless chain extending to one or more terminals. The or each terminal includes an intermediate rotating platform surrounded over at least a portion of its periphery by the conveyance and surrounding, in turn, an inner rotatable platform, with the platforms and the conveyance operating at identical angular velocities so that at the transitions between the conveyance and the intermediate platform and between the intermediate platform and the inner platform there is no relative movement. The inner platform is shiftable vertically to carry the passengers to another level and, possibly, discharge the passengers at this level whereby the vertically shiftable platform can be stopped or slowed angularly to permit such discharge without difficulty.

3,727,559

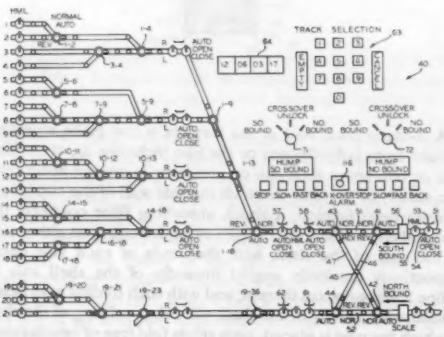
CROSS-OVER CONTROL FOR CLASSIFICATION YARD HAVING TWO HUMP TRACKS

Robert B. McCune, Allendale, and Edward J. Koment, Ramsey, both of N.J., assignors to Abex Corporation, New York, N.Y.

Filed March 1, 1971, Ser. No. 122,629

Int. Cl. B61b *1/00*

U.S. Cl. 104—26 R **8 Claims**



An automated control system for the track switches on the hump tracks of a two-section classification yard having two inlet hump tracks interconnected by a cross-over, allowing manually controlled or automated routing of cars from each hump track to any destination track in either section of the yard. The control system, actuated primarily by two selector switches, affords three distinct operating conditions: (1) automated route switching from the first hump track to any classification track in either section of the yard; (2) automated route switching from the second hump track to any classification track in either section of the yard; and (3) cross-over switching from either hump track to the other under manual control. The system automatically inhibits other operating conditions to preclude erroneous operation.

3,727,560

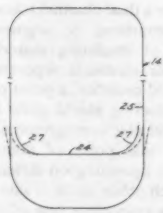
VEHICLE PROPULSION AND GUIDE TRUCK SYSTEM

Marvin S. Blemly, Harbor Springs, and Raymond Becker, Oden, both of Mich., assignors to Jervis B. Webb Company, Detroit, Mich.

Filed Dec. 9, 1970, Ser. No. 96,476

Int. Cl. B61c *11/00*; **B61d** *15/12*; **B61f** *9/00*

U.S. Cl. 104—147 R **16 Claims**



A transportation system in which wheeled carriers are guided by and driven along a plate-like rail member, mounted on edge on a supporting surface for the wheels of the carriers. Each carrier has a pair of pinch rolls engaging opposite vertical sides of the rail, one of the rolls being driven by a motor obtaining power from a conductor bar or bars secured to the sides of the rail above the normal elevation of the pinch rolls to prevent the carrier from jumping the rail. An improved pivotal mounting of the motor and pinch rolls aids in maintaining driving engagement of the pinch rolls with the rail on horizontal and vertical curves.

ERRATUM

For Class 108—42 see:
Patent No. 3,727,544

3,727,561

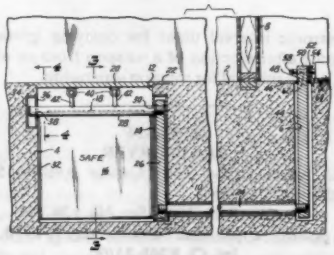
ARRANGEMENT FOR SAFEGUARDING A SECURITY SAFE

Louis Rey, 8056 Carpenter Drive, El Paso, Tex.

Filed March 21, 1972, Ser. No. 236,657

Int. Cl. E05g *3/00*

U.S. Cl. 109—44 **8 Claims**



The floor of a structure has a pair of spaced pits therein, within the first of which a security safe is disposed, said pit

having a removable cover. A concealed shaft extends between the pits, and has latch and lock arms secured to the opposite ends thereof, the arms being simultaneously movable between first and second pivotal positions, and the lock arm being disposed in the second pit. The latch arm is disposed in the first pit and carries latch means engageable with mating latch means on the cover when the arms are in their first pivotal position. A releasable lock is used to secure the lock arm in its first pivotal position, and an alarm system is arranged to give an alarm upon unauthorized movement of said arms from their first pivotal position.

3,727,562

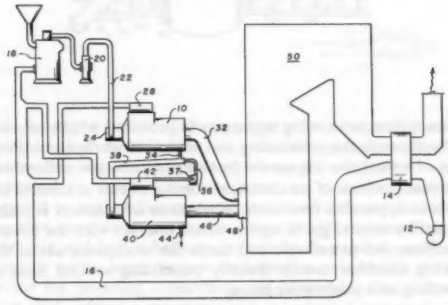
THREE-STAGE COMBUSTION

William Valentine Bauer, New York, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed Dec. 13, 1971, Ser. No. 207,353

Int. Cl. F23b *1/00*

U.S. Cl. 110—1 P **5 Claims**



A three-stage combustion process is disclosed in which solid carbonaceous fuel is burned with a deficiency of air in a first zone leaving unburned fuel and producing a flue gas rich in CO. The unburned fuel is separated from the first zone flue gas and burned in a second zone with an excess of air to produce a flue gas containing excess oxygen. The flue gases from the first and second zones are then burned in a third zone to complete the combustion process with the total amount of air used in the first and second zones being approximately the stoichiometric amount required for complete combustion.

3,727,563

INCINERATOR

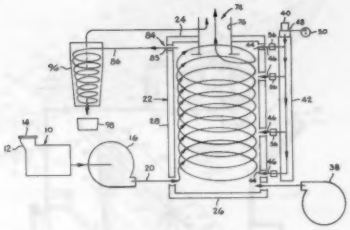
Robert Joel Hasselbring, Shelbyville, and Robert L. Shields, Rushville, both of Ind., assignors to General Electric Company, New York, N.Y.

Filed July 2, 1971, Ser. No. 159,251

Int. Cl. F23g *5/06*

U.S. Cl. 110—8 R **28 Claims**

An incinerator for burning waste material includes a horizontally extending combustion chamber having spaced end walls and a side wall through which a mixture of waste material and air is introduced under pressure tangentially for establishing a vortical movement of the waste material toward one of the end walls. The waste material is ignited during its vortical movement and the chamber includes a discharge flue port near the one end wall which is concentric with the longitudinal axis of the chamber and which has an open end in the chamber spaced axially of the one end wall. A second discharge port extends tangentially through the chamber side wall adjacent the bottom of the chamber at one side thereof for discharging from the chamber non-combustible material entrained in the outer region of the vortex. The discharged material is conveyed through a conduit to a separator which separates the discharged gases and solid material. A baffle is mounted on the flue adjacent its open end for deflecting outwardly toward the side wall solid material which moves from adjacent the one end wall toward the open end of the flue. Means are provided for introducing secondary air into the chamber tangentially to the chamber side wall at a plurality of spaced regions which are aligned horizontally and which are located adjacent the bottom of the chamber at the other side thereof such that one of said regions is substantially opposite



the second discharge port. Control means including dampers are provided for independently adjustably controlling the amount of secondary air flowing into the chamber at each spaced region. Also, automatic control means are provided for controlling generally the secondary air in accordance with variations of temperature within the chamber.

3,727,564

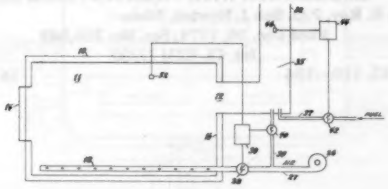
MODULATED FUEL

William M. Anderson; Han Liu, both of Wellsville, and Richard F. Stockman, Friendship, all of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Sept. 9, 1971, Ser. No. 181,142

Int. Cl. F23g *5/00*

U.S. Cl. 110—8 R **3 Claims**



An incinerator system is disclosed including a primary combustion chamber for the pyrolysis of combustible material and a serially connected secondary combustion chamber for complete combustion of the gas produced by pyrolysis in the primary combustion chamber. An independent fuel supply is provided and its flow to the secondary combustion chamber is continuously modulated to supplement the gas being supplied thereto by pyrolysis of combustible material in the primary chamber to provide a substantially constant flow of fuel to the secondary combustion chamber that burns at a uniform rate and temperature.

3,727,565

APPARATUS FOR THE BURNING OF SOLIDS

Fritz Schoppe, Munich, and Georg M. Meyer, Hamburg, both of Germany, assignors to Fritz Schoppe, Munich, Germany

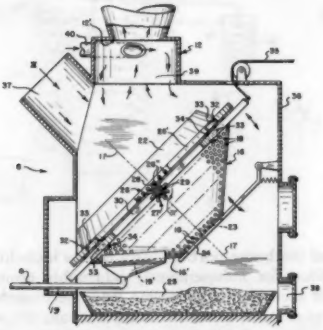
Continuation of Ser. No. 739,977, May 27, 1968, abandoned, which is a continuation of Ser. No. 544,107, May 31, 1966, abandoned, which is a division of Ser. No. 285,983, June 6, 1963, abandoned. This application April 27, 1970, Ser. No. 29,757

Int. Cl. F23g *5/06*

U.S. Cl. 110—14 **34 Claims**

A system to burn waste materials with essentially complete combustion including a vertical preheating chamber with

upper waste inlet and lower outlet, the outlet conducting preheated material into a furnace having a rotating frusto-conical grate with a vertex angle of between 90° and 120° arranged somewhat horizontal so a lowermost surface line is slightly inclined down toward the large inlet end of the grate relative to a horizontal reference. The furnace has an air inlet system which directs a controlled amount of combustion air to a



specific limited zone of the grate. The grate, its disposition and the air supply provide a waste material movement and burning to maximize effective use of combustion heat. The system also has apparatus for removing waste solids and gases from the furnace, with components to cool, wash and separate small solids from the waste gas and to utilize controlled quantities of the waste gas for introduction back into the inlet end of the preheating chamber.

3,727,566

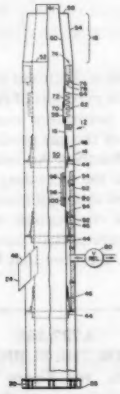
SMOKESTACK WITH VIBRATION DAMPER

John R. Roy, P.O. Box J, Newton, Mass.

Filed Dec. 10, 1971, Ser. No. 206,849

Int. Cl. F23j *11/00*

U.S. Cl. 110—184 **16 Claims**



A free-standing chimney stack having a pair of spaced integral tubular metal shells and means to support the shells on a base. The shells have mutual frictional engagement through spring stabilizer guides located near the top of the stack. The stabilizer guides are preloaded by adjustment of the springs to produce predetermined frictional bearing pressures, thereby to increase the internal damping of the structure so that for a critical wind speed the resulting vibration is held to a minimum.

3,727,567

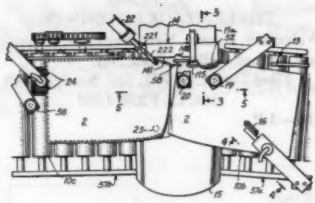
AUTOMATIC SEWING APPARATUS

Aubrey G. Beazley, El Paso, Tex., assignor to Farah Manufacturing Company, El Paso, Tex.

Continuation-in-part of Ser. No. 851,303, Aug. 19, 1969, Pat. No. 3,589,320. This application March 12, 1971, Ser. No. 123,534

Int. Cl. D05b *27/00*

U.S. Cl. 112—121.11 **13 Claims**



An automatic sewing apparatus is provided which sequentially controls the positioning and sewing of workpieces. Position of a workpiece is sensed by two photoelectric cells which activate portions of an electrical control circuit to control the various apparatus functions. Workpiece orientation is maintained by several guide means which interact with the sewing machine. An extendable rod turns the workpiece about the sewing machine needle thereby permitting several lines of stitching on a single workpiece.

3,727,568

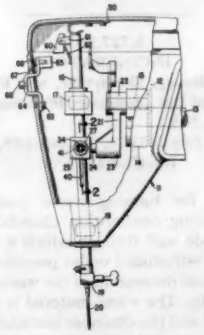
SKIP STITCH MECHANISM FOR SEWING MACHINES

Thomas G. Graham, Point Pleasant Beach, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 228,026

Int. Cl. D05b *69/36*

U.S. Cl. 112—221 **1 Claim**

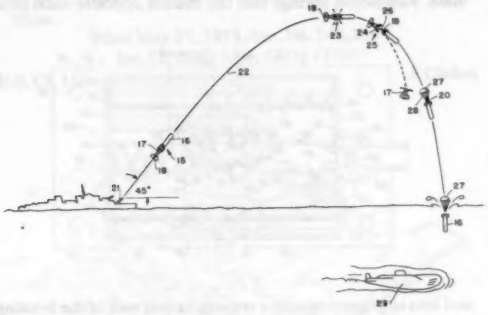


A sewing machine needle reciprocating mechanism is disclosed including clutch mechanism for releasing the endwise reciprocatory drive for the needle bar intentionally to provide for skipped stitches as for basting or the like, and also to provide for an automatic release of the needle bar drive to prevent needle breakage in case the needle should strike an impenetrable object such as a button or the like.

3,727,569
MISSILE

Harold G. Johnson, Trenton, N.J., and Harry Silk, Washington, D.C., assignors to United States of America as represented by the Secretary of the Navy

Filed Feb. 3, 1959, Ser. No. 790,976
Int. Cl. F42b *19/12, 19/00*
U.S. Cl. 114—20 R **9 Claims**



1. A weapon for use against a target submarine, said weapon comprising, in combination: an ordnance apparatus effective to operate against a submerged target submarine when delivered to a suspect water area; an airframe severably secured to said ordnance apparatus, said airframe including reaction propulsion means to project said weapon from a launcher and into a ballistic trajectory directed toward said suspect water area; means including a presettable timing device for severing, separating and jettisoning the airframe from said ordnance apparatus at a preselected instant during airflight; deceleration means secured to said ordnance apparatus and operatively associated with said airframe to become effective upon airframe separation and in response to airframe separation; and means for jettisoning said deceleration means upon water entry of said ordnance apparatus.

3,727,570
DRAG REDUCTION METHOD

John Molinski, Somerset, Mass., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 20, 1970, Ser. No. 12,520
Int. Cl. F42b *19/00*
U.S. Cl. 114—20 R **3 Claims**

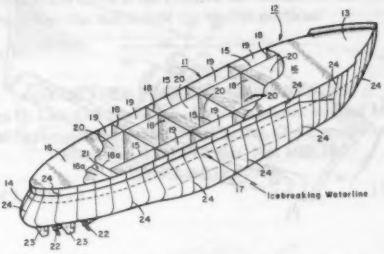
A method for reducing drag on a moving aquatic vehicle is disclosed in which long chain high molecular weight polymers are suspended in a liquid fluorocarbon carrier prior to injection of the suspension into the aqueous boundary layer surrounding the vehicle.

3,727,571
ICEBREAKING CARGO VESSEL

Walter B. Devine, Houston, Tex., assignor to Esso Research and Engineering Company, Linden, N.J.

Filed July 7, 1971, Ser. No. 160,385
Int. Cl. B63b *35/08*
U.S. Cl. 114—41 **7 Claims**

A hull shape for an icebreaking cargo vessel, such as a tank ship, is provided which provides for lower ice breaking resistance, greater displacement in ice, and greater rudder and screw protection against ice when proceeding astern in ice laden or ice covered waters than conventional icebreaking vessels. The hull shape is such that a down breaking bow and a maximum ice-water line beam is provided forward of the midpoint of the hull while aft of the midpoint the ice-water line beam is smaller than that forward, the hull beam below the maximum ice-water line beam being greater than the ice-water line beam in the aft part of the hull. Vertical sections through the hull forward of the mid point slope downwardly

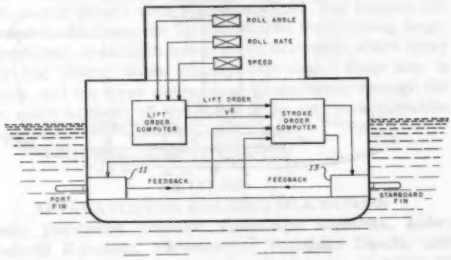


and inwardly while aft the vertical sections slope downwardly and outwardly.

3,727,572
MARINE FIN STABILIZER CONTROL CIRCUIT

Louis W. Nelson, Upper Marlboro, and Charles R. Wesner, Crozet, both of Va., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,676
Int. Cl. B63b *39/06*
U.S. Cl. 114—126 **8 Claims**



A fin stabilizer control circuit accepts signals from a roll angle sensor, a roll rate sensor and a ship's speed sensor. The signals are first processed in a lift order computer which includes an automatic gain control circuit in which the port and starboard lift orders are compared with the square of the ship's speed so as to vary the sensitivity of the control circuits with changes in ship speed and ship residual roll motion. The output signals from the lift order computer are applied to a stroke order computer along with feedback signals representing fin angle and lift. Either feedback signal may be selected for summing with the signal from the lift order computer to produce a stroke order signal that determines the rate of deflection of the stabilizing fins. Limiting circuits in the stroke order computer restrict the stroke order signal in accordance with the larger of the two feedback signals.

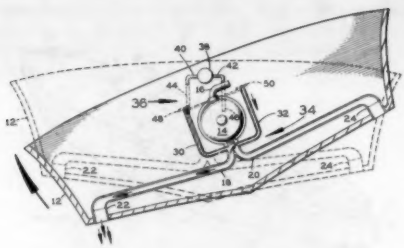
3,727,573
STABILIZING SYSTEM

Peter J. H. Prohaska, 700 N.E. 20th Avenue, Fort Lauderdale, Fla.

Filed June 24, 1971, Ser. No. 156,343
Int. Cl. B63b *39/08*
U.S. Cl. 114—122 **7 Claims**

A stabilizing system for a boat or the like in which water is pumped through a control to two thrusting outlets on different sides of the hull for directing water jets downwardly from the

hull. The control allocates the output of the pump between the first and second outlets in response to the roll of the boat. The



control is actuated by a sensing device responsive to the degree of roll of the boat.

3,727,574

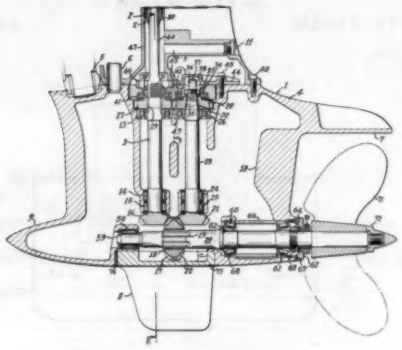
OUTBOARD DRIVE FOR A BOAT

Nils Olof Bagge, Goteborg, Sweden, assignor to AB Volvo Penta, Goteborg, Sweden

Filed Aug. 30, 1971, Ser. No. 175,841

Int. Cl. B63h *5/00*

U.S. Cl. 115—34 R **8 Claims**



An outboard drive for a boat having a generally horizontal propeller shaft driven through gearing from two generally vertical rigid drive shafts between which the torque is shared. The drive shafts are gear connected in the upper part of the unit by transmission gears arranged to pump oil within the unit housing and the two shafts are driven by a single shaft from a power source. The transmission gears are so adjusted on their respective shafts as to cause the torque to be equally divided between the two drive shafts.

3,727,575

BIDIRECTIONAL SENSOR

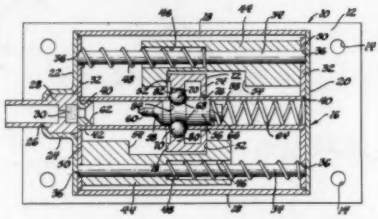
Otakar P. Prachar, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 11, 1971, Ser. No. 197,736

Int. Cl. G01d *21/00*

U.S. Cl. 116—114 AH **4 Claims**

A bidirectional sensor includes a rectangular housing mounted on a base plate. A hollow cylindrical guide tube extends between opposite end walls of the housing and slidably receives an operator therewithin. A coil spring seating between one end wall and the operator biases the operator toward the other end wall to actuated position wherein the operator engages a primer or closes an electrical circuit. Three equally spaced radial openings in the wall of the tube receive respective balls which seat in a circumferential arcuate groove of the operator to detent the operator against movement under the spring bias. The balls are constrained against movement outward of the openings by a cylindrical detent member which surrounds the operator and has a first cylindrical shoulder thereof seating the balls in the operator groove and a second cylindrical shoulder slidable along the guide tube. A pair of rods extend parallel to the guide tube axis and slidably mount rectangularly shaped seismic masses, each having spaced shoulders provided by a cutout in the mass. Respective springs bias the masses opposite each other



and into engagement with a respective end wall of the housing. One shoulder of each mass engages the detent member, generally diametrically and axially opposite of the other shoulder, to locate the detent member in detent position. Should either mass move against its bias under an acceleration pulse of predetermined amplitude and time, the other shoulder will engage the detent member to move the detent member out of engagement with the one shoulder of the other mass and move the first shoulder of the detent member out of engagement with the balls to release the operator.

3,727,576

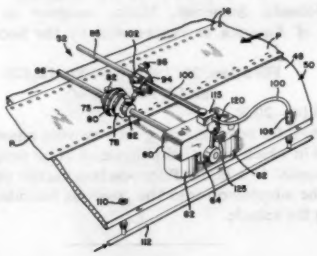
PORTABLE GLUE APPLICATOR FOR COLLATING MACHINE

Louis Schriber, Dayton, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Sept. 20, 1971, Ser. No. 181,931

Int. Cl. D05c *1/16*

U.S. Cl. 118—211 **10 Claims**



A housing containing one or more magnets provides a cantilever support for a pair of spaced and parallel rods which extend outwardly over one or more web sets moving therebelow over a table section of a collator. The leading rod supports a wheel frictionally driven by the upper web and also a spotting disk linked to the wheel and having a plurality of spaced, arcuate applicator surfaces circumferentially aligned with the periphery of the wheel. A glue dispensing nozzle is mounted on the trailing rod and is rotatable between a raised position with the nozzle applying glue to the arcuate surfaces of the spotting disk which in turn apply the glue to the web in spot form, and a lowered position with the nozzle positioned for applying glue directly onto the moving web in strip form. The leading rod is adjustable in height to accommodate varying widths of webs or webs sets passing over the table. A manifold supplies glue to a plurality of outlets along the table, and the

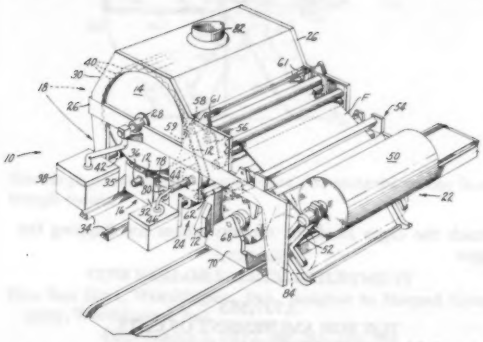
applicator includes a quickdisconnect fitting so that it may be moved to any position along the table and quickly connected to any one of the outlets.

3,727,577

MACHINES FOR COATING SHEET MATERIAL

John Joseph McGarr, and Bruce Ward Vorhauer, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed May 27, 1971, Ser. No. 148,250
Int. Cl. B05b *5/02*; **G03g** *13/06*
U.S. Cl. 118—630 **5 Claims**



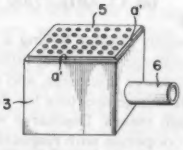
A continuously operative coating machine electrostatically deposits heat activatable powdered polymers, for example polyurethane, on a release carrier which progressively passes through a heating zone. The powder is applied from an electrostatic fluidized bed employing a microporous wire cloth as both bed and charging grid. Deposited powder is transformed to a film which is brought into adhering relation to flexible sheet material such as a fabric to be coated. The carrier and the sheet material then pass over a cooling means where the film is solidified and bonded to the material and the unloaded carrier is returned for receiving further powder deposits. The powder bed may include compartments for successive application of different types of powder particles. An ionized zone preferably insures that the recirculated carrier is free from any residual positive or negative charge which might affect the charged powder particles to be deposited by the electrostatic fluidized bed. An alternative arrangement employs a reuseable release paper backed by a metallic flexible strip for transfer of the film to the sheet material. When either arrangement is operated without supplying sheet material, it may with slight modification be used to produce plastic sheeting per se.

3,727,578

ELECTROPHOTOGRAPHIC DEVELOPING DEVICE USING LIQUID

Takashi Saito, and Shusei Tsukada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1970, Ser. No. 76,729
Claims priority, application Japan, Oct. 11, 1969, 44/81378
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **7 Claims**



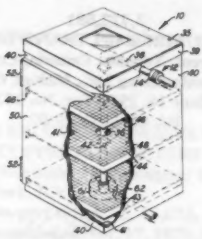
Various structures are disclosed for producing a layer of liquid developer to cover the visible portion of an edge mounted section of an electrophotographic recording medium without wetting the mount beyond the edges bordering said visible portion. During application of the developer to said visible portion there is no relative movement of the developer device across the surface of the visible portion.

3,727,579

LOBSTER PRESERVATION SYSTEM

James O. Lee, Old Saybrook, Conn., assignor to Olaf M. Olsen, Old Saybrook and John L. McCarthy, Old Lyme, Conn.

Filed Dec. 21, 1970, Ser. No. 100,195
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 **11 Claims**



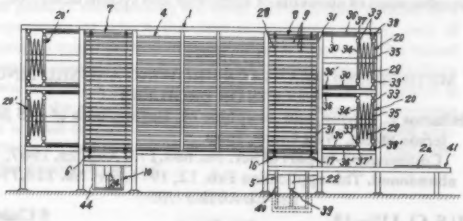
Fresh-caught lobsters are mounted in quick-connect containers for connection into or removal from a system, and transfer to at least one other similar system. The system provides temperature-conditioned aerated salt water which is continuously sprayed upon the lobster in the container from the time it is caught until it is finally sold. The lobsters are disposed in the container on foraminous trays having large, unobstructed, open mesh screen surfaces through which spray water and lobster waste continuously drain. Each tray is sprayed, and the spray water passes immediately through the open mesh surfaces of the trays so as not to accumulate thereon.

3,727,580

APPARATUS FOR REARING SILKWORMS

Seisuke Yumiyama, Ibaraki; Yoshitsugu Kinoshita, Kobe; Tadashi Kusunoki, Nishinomiya; Toshihiko Okada, and Susumu Shimizu, both of Ayabe, all of Japan, assignors to Ganze Limited and Takeda Chemical Industries, Ltd.

Filed Oct. 7, 1971, Ser. No. 187,452
Claims priority, application Japan, Oct. 13, 1970, 45/90248
Int. Cl. A01k *67/04*
U.S. Cl. 119—6 **8 Claims**



An apparatus for rearing silkworms comprising, a first elevator conveyor having a multiplicity of supports for carrying rearing units in such manner that the rearing units can be pushed out from one side of the conveyor toward the other side, each of the rearing units being composed of a feeding tray and a net superposed on the feeding tray, a rearing frame having a multiplicity of shelves each having one end to be connected to the discharge end of each of the shelves on the con-

veyor, a second elevator conveyor having a multiplicity of shelves each having one end to be connected to the other end of each of the shelves on the rearing frame, a rearing unit loader provided for the first elevator conveyor, a rearing unit pusher provided for the first elevator conveyor, a rearing unit unloader provided for the second elevator conveyor, a conveyor connected to the rearing unit loader for supplying fresh feeding trays, a conveyor connected to the rearing unit unloader for discharging old feeding trays, and a carriage connecting the first elevator conveyor to the second elevator conveyor for receiving the net separated from the feeding tray, permitting the feeding tray to be delivered onto the discharge conveyor, and returning the net alone to the first elevator conveyor.

3,727,581

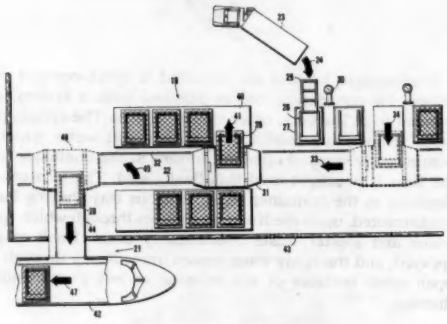
LIVE ANIMAL AIRCRAFT TRANSPORT SYSTEM

William Donald Brent, Toronto, Ontario, Canada, assignor to W. D. Brent Manufacturing Ltd., Malton, Ontario, Canada

Filed June 16, 1971, Ser. No. 153,523

Int. Cl. A01k *29/00*

U.S. Cl. 119—17 **7 Claims**



The following specification discloses a system and apparatus organising the loading, transport and delivery of live animals over great distances within a period of time during which feeding is rendered unnecessary and permitting health inspection prior to loading thus to achieve immediate delivery to the premises of the buyer without deterioration of the condition of the animals and sets forth a container structure and assembly adapted to be loaded, weighed, stored and transferred to an aircraft and locked thereon and at its destination to be unloaded and shipped directly to the purchaser in the combination of elements of apparatus and system described.

3,727,582

METHOD AND MEANS FOR GROWING AND SHIPPING PULLETS OR BROILERS

Hilarius L. Heying, and Josephine M. Heying, both of 115 Jefferson Street, West Union, Iowa

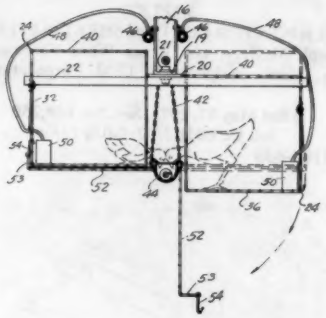
Continuation-in-part of Ser. No. 664,173, Aug. 29, 1967, abandoned. This application Feb. 12, 1971, Ser. No. 114,774

Int. Cl. A01k *31/06*

U.S. Cl. 119—18 **5 Claims**

A method of growing and shipping pullets or broilers comprising: hatching a flock of baby chicks; dividing the flock into groups of from about four to about twenty or more; placing each group in a separate cage; raising the birds in the cages to the age of 20 to 22 weeks and shipping to buyers in the cages in which they were raised.

Means for growing and shipping chicks comprising a cage sized to accommodate from about four to about twenty or more birds of laying age; feed and watering means adjustable to accommodate growth; support means to suspend the cages from brackets; bird access means on each cage; means to



detach the cages from the support means for shipping the cages.

3,727,583

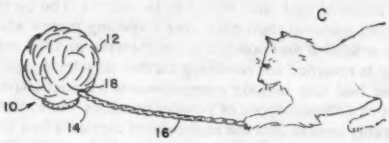
TOY FOR AMUSEMENT OF CATS

Robert J. Muraro, 3008 E. Pratt St., Baltimore, Md.

Filed March 9, 1971, Ser. No. 122,469

Int. Cl. A01k *15/00*

U.S. Cl. 119—29 **7 Claims**



An amusement device for cats comprising a discontinuous yarn retracting and storing mechanism enclosed in a housing and adapted to pay out yarn retractably when the yarn is pulled by a cat being amused. The mechanism retracts the yarn silently and with an intermittent motion; a lure may be attached to the free end of the yarn, and the housing may be shaped like a ball of yarn. Means are provided to support the device on floors.

3,727,584

ANIMAL FOOD SUPPLEMENT DISPENSER AND FEEDER

Arthur C. Permann, Delmont, S. Dak.

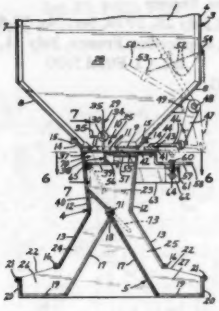
Filed Sept. 16, 1971, Ser. No. 181,075

Int. Cl. A01k *05/00*

U.S. Cl. 119—56 R **5 Claims**

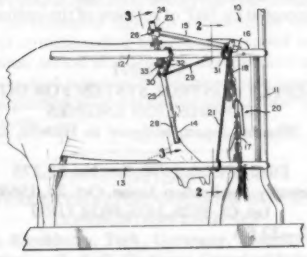
An elongated supply hopper having a plurality of longitudinally spaced discharge apertures, individual feeder valves for each of the discharge apertures, and delivery conduits individual to each discharge aperture for delivery of food to individual feed trough means. Discharge valves in each of the delivery conduits cooperate with respective feeder valves and metering valve elements individual to each delivery conduit to define measuring chambers. Feeder valve operating means

and discharge valve operating means control feeding of material from the hopper to each measuring chamber and



discharge of measured quantities of the material to the feed trough means.

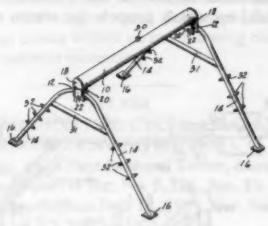
3,727,585
COW PARLOR SAFETY ADJUSTMENT
Don Rex Hart, Worthington, Ind., assignor to Harpad Company, Worthington, Ind.
Filed March 1, 1972, Ser. No. 230,742
Int. Cl. A01j 7/00
U.S. Cl. 119—96 **2 Claims**



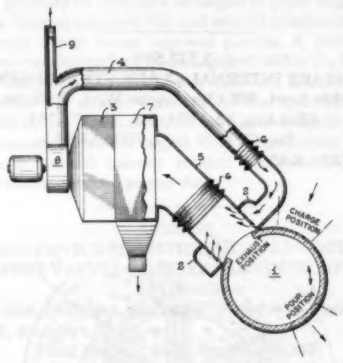
A device for restraining a stalled cow from kicking, being an improvement upon the disclosure of U.S. Pat. No. 3,451,377 and consisting primarily in the provision on the swing bar of a bracket adjustable longitudinally on the swing bar and formed with a plurality of longitudinally-spaced sets adapted selectively to receive a rail of the stall to hold the swing bar against longitudinal movement relative to the rail.

3,727,586
LIVESTOCK OILER
Donald H. Brewster, 405 South Main Street, Sheridan, Wyo.
Filed March 3, 1971, Ser. No. 120,395
Int. Cl. A01k 29/00; A61d 11/00
U.S. Cl. 119—157 **4 Claims**

A livestock oiler built in the shape of a saw-horse can be assembled from ordinary metal pipe, bars and plate. Dual plunger valves mounted in the legs of the oiler open when rubbed against by livestock, allowing insecticide or other medicament to flow by gravity from a receptacle mounted at the top of the oiler into the hollow pipe legs and out through the valves. The oiler is simple and economical to construct. Pairs of these outwardly, spring-biased valves are mounted in opposite ends of sleeves which pass completely through the pipe legs. The valves have an elongated slot passing transversely therethrough, and the sleeves have transverse openings in each end to receive a pin. The pin cooperates with the associated plunger valve slot to limit the outward movement of the plunger valve.



3,727,587
SYSTEM FOR RECOVERING WASTE HEAT FROM COPPER CONVERTERS
William Nebgen, Woodside, N.Y., assignor to Treadwell Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 44,673, June 9, 1970, abandoned. This application Nov. 17, 1971, Ser. No. 199,738
Int. Cl. F22b 1/18
U.S. Cl. 122—7 A **6 Claims**

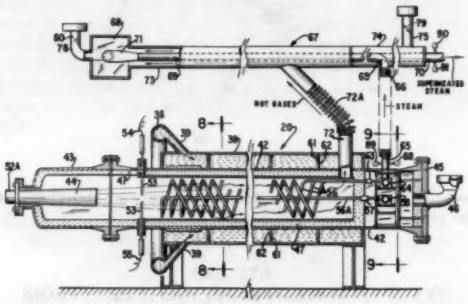


A copper converter in which copper sulfide is burned to sulfur dioxide is operated with a tight air hood. The gaseous products from the converter contain dust, which melts or is sticky at the temperature at which the gases leave the converter. The gaseous products are mixed with a large amount of cool gases of substantially the same sulfur dioxide content to a temperature at which the dust is no longer sticky, and, if desired, a major portion of the dry dust is removed. The mixed gases are passed through a waste heat boiler which cools them down further. A major portion of the cooled mixed gases is used for the recycling with the hot gases from the converter and a small amount corresponding to the air used in the converter is vented to a plant, such as an acid plant, in which the sulfur dioxide is utilized.

3,727,588
THERMAL ENERGY GENERATION
Sigmund Lance Ross, New York, N.Y., assignor to Oscar Shuffman, Scarsdale, N.Y.
Filed Nov. 26, 1971, Ser. No. 202,215
Int. Cl. F22g 5/12
U.S. Cl. 122—487 **17 Claims**

Impure water is continuously sprayed into an elongated conduit having an inlet for the water adjacent one end and an open outlet remote from the inlet while maintaining the inner

surface of the conduit at a temperature such that the water not only is flashed into steam but also is substantially immediately converted into superheated steam under the confinement imposed by the inner surface of the conduit with concomitant pressure build-up which propels the steam and superheated



steam toward the outlet with a velocity at which the conduit is self-scavenging in that there is no deposit on or attack on the inner surface of said conduit and said inner surfaces remain clean notwithstanding indefinitely long periods of continuous operation.

3,727,589

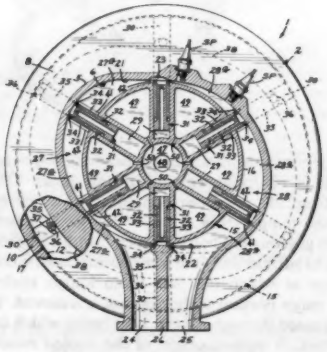
ROTARY INTERNAL COMBUSTION ENGINE

Wilbert Milo Scott, 808 13th Avenue West, Williston, N. Dak.

Filed Aug. 12, 1971, Ser. No. 171,261

Int. Cl. F01c *1/00*; F02b *53/00*

U.S. Cl. 123—8.45 **3 Claims**



A rotary internal combustion engine including a housing having a generally oval inner peripheral wall surface slidingly engaged by vanes radially slidably carried by a cylindrical rotor. The rotor includes a main rotor body and circumferential end flanges projecting radially from opposite ends of the body, the end flanges having radial grooves supporting the opposite ends of the vanes. The vanes operatively engage cam tracks in the housing to keep the vanes substantially in engagement with the generally oval inner wall surface during rotation of the rotor. The rotor cooperates with the housing to define a plurality of chambers, the number of chambers and the number of power impulses of the engine per revolution of the rotor equaling the number of vanes on the rotor.

3,727,590

FUEL SUPPLY SYSTEMS FOR FOURSTROKE INTERNAL COMBUSTION ENGINES

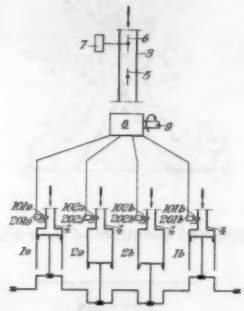
Andre Louis Mennesson, 92 Neuilly sur Seine, France, assignor to Societe Industrielle de Brevets et D'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed July 28, 1970, Ser. No. 58,852

Claims priority, application France, July 31, 1969, 6926308

Int. Cl. F02d *5/00*

U.S. Cl. 123—32 G **2 Claims**



The system enables the supply of fuel to a four-stroke internal combustion engine comprising two pairs of cylinders in each pair of which the cycles of the two cylinders are separated by 360° of rotation of the engine shaft. It includes four injection valves actuated by electromagnets controlled by an actuating device driven by a shaft at half the speed of the engine shaft. It is arranged so that each cylinder of each pair receives on each cycle two doses of fuel for periods of equal duration separated by 360° of rotation of the engine shaft.

3,727,591

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

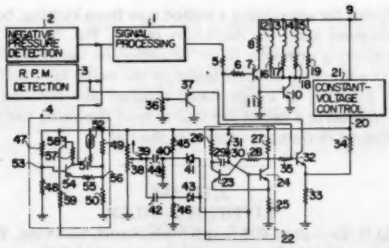
Seiji Suda, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1970, Ser. No. 82,275

Claims priority, application Japan, Oct. 24, 1969, 44/84718

Int. Cl. F02b *3/00*; F02d *31/00*

U.S. Cl. 123—32 EA **5 Claims**

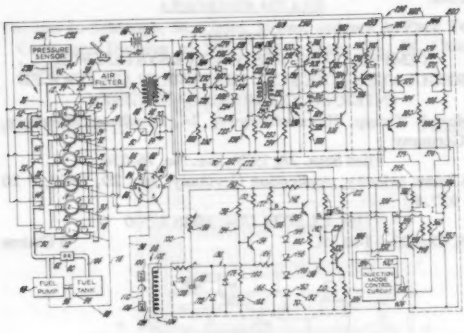


A fuel supply control system for internal combustion engines for controlling the fuel supply controlling electromagnetic valves on the basis of processing electric signals representing respective engine operating parameters such as engine intake manifold negative pressure and engine r.p.m., wherein the electromagnetic valves are rendered inoperative to cut the fuel supply if the engine r.p.m. is above a predetermined value and if the angular speed of the motion of the engine throttle in the direction of closing the engine throttle valve exceeds a predetermined value.

3,727,592
ELECTRONIC FUEL INJECTION SYSTEM

Lester Wilkinson, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1971, Ser. No. 198,652
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA 3 Claims

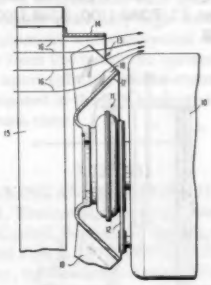


In an internal combustion engine, the operation of at least a pair of fuel injectors is switched from independent energization per engine cycle to simultaneous energization when the amplitude of a speed signal is below the amplitude of a reference signal at the initiation of a timing pulse. The amplitude of the speed signal increases over the duration of a first portion of each engine cycle so that the amplitude of the speed signal is inversely related to the speed of the engine. The timing pulse is initiated at the expiration of a second portion of each engine cycle terminating within the first portion. The amplitude of the reference signal is substantially constant at a voltage level corresponding to an engine speed at which the maximum time period available for independent energization of each of the fuel injectors per engine cycle approaches the desired energization time period for each of the fue injectors per engine cycle.

3,727,593
INSTALLATION FOR COOLING INTERNAL COMBUSTION ENGINES

Kurt Enke, Kirchheim, Teck, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 17, 1971, Ser. No. 209,310
Claims priority, application Germany, Dec. 19, 1970, P 20 62 765.0
Int. Cl. F01p *7/02*, *5/06*
U.S. Cl. 123—41.12 15 Claims

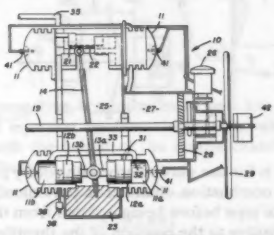


An installation for cooling internal combustion engines for motor vehicles by means of a fan driven by the internal combustion engine, possibly by way of an engageable and disengageable coupling controlled, for example, as a function of temperature; the cooling installation is arranged between the radiator and the internal combustion engine and utilizes a so-called semi-axial fan with a hub that increases conically in the direction toward the engine and possesses substantially straight blades that rotate within an outer casing ring secured at the radiator or radiator mounting.

3,727,594
LOW EMISSION TWO CYCLE AXIALLY RECIPROCATING ENGINE

William N. Schultz, 1610 First National Tower, Akron, Ohio

Continuation-in-part of Ser. No. 5,226, Jan. 23, 1970, abandoned. This application Dec. 14, 1971, Ser. No. 207,760
Int. Cl. F02b *41/02*, *75/26*
U.S. Cl. 123—58 BB 10 Claims

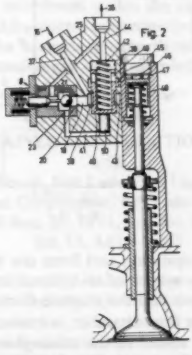


An internal combustion engine of the two cycle type includes a plurality of cylinders arranged in pairs, each pair of cylinders forming opposed first and second combustion chambers therein which house opposed pistons. A conventional fuel-air mixture is received by and ignited within the first combustion chamber of each cylinder pair and is thereafter exhausted into the second chamber or the opposed cylinder along with an amount of fresh air for a second ignition before being exhausted from the engine. The reciprocating action of the pistons created thereby rotates a conventional crank wheel to turn a standard power shaft.

3,727,595
CONTROL DEVICE FOR HYDRAULICALLY OPERATED TAPPET VALVES OF INTERNAL COMBUSTION ENGINES

Heinz Links, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 31, 1970, Ser. No. 68,362
Claims priority, application Germany, Aug. 30, 1969, P 19 44 177.1; Dec. 16, 1969, P 19 62 916.4; Feb. 12, 1970, P 20 06 304.1; Feb. 14, 1970, P 20 06 844.4; Feb. 25, 1970, P 20 08 668.4; March 5, 1970, P 20 10 291.4
Int. Cl. F01l *9/02*
U.S. Cl. 123—90.12 1 Claim



In an internal combustion engine, each intake and exhaust valve is operated by an actuating piston, which, in turn, is

reciprocated by hydraulic liquid admitted under pressure to, and withdrawn from said piston intermittently by means of a solenoid valve.

3,727,596

IGNITION DEVICES FOR INTERNAL COMBUSTION ENGINES AND ENGINES INCLUDING SUCH DEVICES

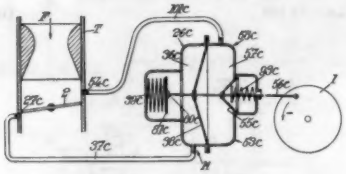
Jean Panhard, Paris, France, assignor to Societe de Constructions Mecaniques Panhard & Levassor, Paris, France

Filed Feb. 27, 1970, Ser. No. 15,099

Claims priority, application France, Feb. 28, 1969, 6905579

Int. Cl. F02p *5/04*

U.S. Cl. 123—117 A **9 Claims**



The device is for use particularly with rotary piston engines in which the combustion chamber is periodically connected with the intake pipe before being isolated from the exhaust. It has means sensitive to the position of the throttle valve and to the rotary speed of the engine. These means move a plate in the direction of ignition retard when the degree of opening of the throttle valve is less than a certain limit P_L and the rotary speed is greater than a certain limit N_L. The means may be constituted by an electrical contact and a centrifugal contact, which when both are closed actuate the ignition retard. The means may also be two suction capsules connected to selected points in the intake pipe, working in opposition and connected to the same stem. The capsules are calibrated to operate beyond certain predetermined suction thresholds.

3,727,597

DEVICE FOR PRECIPITATING FUEL FROM THE VAPOR DISCHARGING FROM THE FUEL SUPPLY SYSTEM OF AN INTERNAL COMBUSTION ENGINE

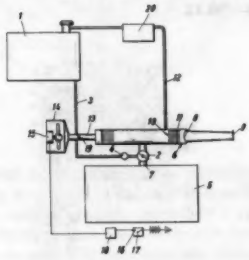
Paul Hensler, Stuttgart-Stammheim, Germany, assignor to Firma Dr. Ing. F. Porsche K.G., Stuttgart-Zuffenhausen, Germany

Filed May 8, 1970, Ser. No. 35,666

Claims priority, application Germany, May 28, 1969, 19 27 046.3

Int. Cl. B01d *50/00;* **F02m** *59/00*

U.S. Cl. 123—136 **13 Claims**



A device for precipitating fuel from the vapor discharging from the fuel supply system of an internal combustion engine in which the fuel tank and the mixture-forming system, especially the carburetor float chamber, is connected through pipe lines to a chamber sealed to the atmosphere and defined by the volume of the intake air filter. A filter insert is placed ahead of the air intake and has a layer of activated carbon which absorbs the fuel particles from the vapor passing through the filter. The intake air filter is also provided with an exhaust-connecting piece which is connected to the suction side of a blower exhausting into the atmosphere. The blower is driven by an electric motor which is supplied with power through a contact provided in the starting-ignition switch and a time-control element which automatically interrupts the current supply to the blower motor after a predetermined time period.

3,727,598

TEMPERATURE-RESPONSIVE SYSTEM FOR REGULATING THE FUEL MIXTURE IN AIR-COOLED INTERNAL COMBUSTION ENGINES

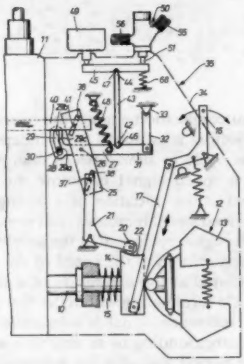
Heinrich Knapp, Hummelbergweg 24, Leonberg-Silberberg, Germany

Filed Sept. 28, 1970, Ser. No. 76,036

Claims priority, application Germany, Jan. 29, 1970, P 20 03 927.4

Int. Cl. F02d *1/04;* **F02n** *17/00*

U.S. Cl. 123—140 MC **3 Claims**



In the cooling circuit of an air-cooled internal combustion engine there is disposed a temperature responsive member which moves a lever connected to a fuel quantity control member of a fuel injection pump. The transmission of motion from said lever to said control member is affected by a contoured control edge or cam track provided in the former.

3,727,599

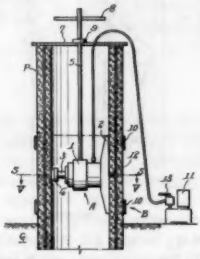
METHOD OF AND APPARATUS FOR CUTTING HOLLOW PRECAST CONCRETE PILES OR THE LIKE

Rokuro Sugiki, Ohta-ku, Tokyo; Takemitsu Mori, Kokubunji-shi, Tokyo, and Tomoyuki Hayakawa, Kawasaki-shi, all of Japan, assignors to Nippon Concrete Kogyo Kobushiki Kaisha, Tokyo, Japan

Filed July 27, 1971, Ser. No. 166,391

Int. Cl. B28d *1/00;* **B26f** *3/00*

U.S. Cl. 125—23 R **5 Claims**



Hollow precast concrete piles can now be cut in their state driven into the ground to remove their top portion extending

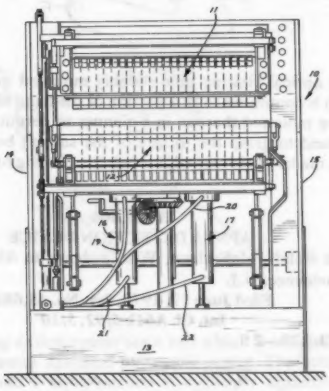
above the ground with efficiency and without causing any substantial noise or any damage to the lower major pile portion set in the ground principally by mechanically applying a shearing force to the pile substantially radially in a transverse cross section thereof at the level where the pile is to be cut.

3,727,600

HYDRAULIC STONE SPLITTER WITH SHOCK ABSORBER MEANS

Thomas L. Schlough, St. Cloud, Minn., assignor to Park Tool Company, Division of The Gran-A-Stone Co., St. Cloud, Minn.

Filed Oct. 12, 1971, Ser. No. 188,159
Int. Cl. B28d *1/32*
U.S. Cl. 125—23 C **5 Claims**



A shock absorber system for power rams employing a cylinder having a piston with a force-applying shaft coupled thereto, the piston being arranged for reciprocatory motion within the cylinder, and with the piston separating a high pressure chamber segment from a lower pressure chamber segment, the shock absorbing system including conduit means coupling the low pressure chamber segment to orifice means for permitting restricted flow of fluid from the low pressure chamber to the reservoir, and with a pressure relief valve coupled to the low pressure chamber segment, and being disposed in parallel relationship with the orifice to permit fluid flow therethrough when pressure within the low pressure chamber exceeds a certain predetermined level. Flow control valves in the form of pilot-actuated check valves are arranged to maintain the system in flooded relationship during idle periods, with the check valves being functional to isolate flow channels during operational portions of the working cycle. The shock abosrber system of the present invention is particularly adaptable for use in conjunction with hydraulically actuated rams utilized to apply extremely high forces to the jaws of stone splitting equipment, with this system reducing the rate of transfer of shock from the hydraulic system to the remainder of the structure upon splitting of the stone, with this shock energy being dissipated in the low pressure side of the hydraulically actuated main rams.

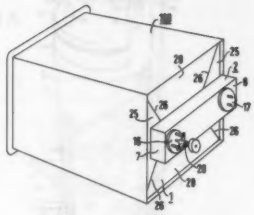
3,727,601

BAKING AND ROASTING OVEN

Johann Klement, Traunreut, Germany, assignor to Siemens-Electrogerate GmbH, Berlin and Munich, Germany

Filed Feb. 9, 1972, Ser. No. 224,693
Claims priority, application Germany, Feb. 12, 1971, P 21 06 775.4
Int. Cl. A21b *1/26*
U.S. Cl. 126—21 A **21 Claims**

Baking and roasting oven which includes a muffle chamber having a top wall, a bottom wall and a lateral wall extending between the top and bottom walls, also has a heating means including a circulating blower for hot air, a blower channel for the hot air circulated by the blower, the blower channel inter-



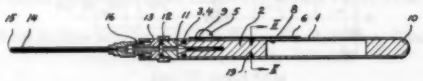
connecting respective hot air exhaust and hot air injection openings and injection openings being at an elevation of at least one-fourth the height of the muffle chamber from the bottom wall thereof.

3,727,602

INSTRUMENT FOR TAKING SAMPLES FROM INTERNAL ORGANS

Victor Holger Hyden, and Sune Torsten Larsson, both of Goteborg, Sweden, assignors to said Hyden and Victor, by said Larsson

Filed Jan. 28, 1971, Ser. No. 110,445
Claims priority, application Sweden, June 15, 1970, 8251/70
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 B **3 Claims**



An instrument for taking samples from internal organs of humans and animals in which a cannula for insertion into the organ is detachably connected to a handle portion provided with a plunger pump for drawing the sample into the cannula and a needle of homogeneous material is secured in the pump plunger for axial movement within the cannula and serves to prevent undesired fragments of connective tissues entering the cannula when the cannula passes through the tissues surrounding the internal organ being sampled.

3,727,603

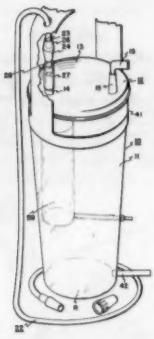
DOUBLE CONTAINER CONSTRUCTION FOR HOSPITAL USE

Le Grand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Filed Aug. 25, 1971, Ser. No. 174,669
Int. Cl. A61b *19/00*
U.S. Cl. 128—2 F **8 Claims**

A double-liquid-container construction and accessories usable in urinary tract drainage systems, by way of example, for permitting measurements of successive volumes of drained liquid during pre-selected time spans. An interior container is disposed within an exterior container, the first being graduated and provided with valved outlet means for drainage of the

subject liquid into the second container. Improved strap facilitates drainage tube erection and over-all bottle support



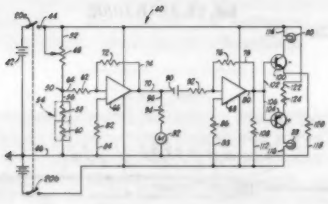
from an overhead bracket, or the like. Single and double bacterial traps are included within the structure.

3,727,604

EMOTIONAL LEVEL INDICATOR

Toney W. Sidwell, 2413 N.W. 113th Place, and George F. Reese, 2855 Taft Avenue Southwest, both of Oklahoma City, Okla.

Filed Oct. 26, 1971, Ser. No. 192,515
Int. Cl. A61f 5/05; A61b 5/05
U.S. Cl. 128—2.1 Z **12 Claims**



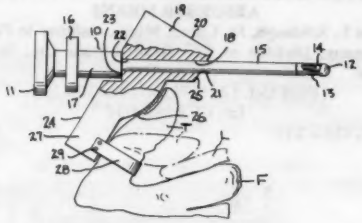
An improved emotional level indicator constructed to provide immediate, visual feedback information relative to the changes in an individual's emotional level (changes in the activity of an individual's sympathetic system) which includes an emotional transducer for measuring changes in the individual's emotional level (skin resistance) and providing an output signal responsive to such changes. The output signal of the emotional transducer is amplified and connected to a meter such that the position of the meter is indicative of a particular, relative emotional level, and such that movement of the meter indicator is indicative of whether the individual's emotional level is increasing or decreasing. The amplified output signal of the emotional transducer is further connected to a positive rate transistor amplifier and to a negative rate transistor amplifier, the rate transistor amplifiers being connected such that the positive rate transistor amplifier conducts when the individual's emotional level is increasing, and such that the negative rate transistor amplifier conducts when the individual's emotional level is decreasing. The emotional level indicator further includes a light indicator connected to the positive rate transistor amplifier and a light indicator connected to the negative rate transistor amplifier such that the light indicators provide immediate, visual feedback information indicative of whether the individual's emotional level is increasing or decreasing relative to an initial or predetermined emotional level setting.

3,727,605

LARYNGOSCOPE

Harold C. Klein, 2957 South Park Boulevard, Shaker Heights, Ohio

Filed Dec. 10, 1970, Ser. No. 96,862
Int. Cl. A61b 1/26
U.S. Cl. 128—11 **7 Claims**



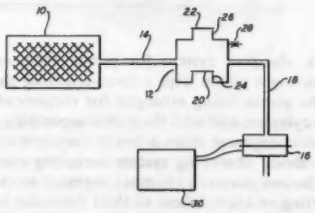
An optical viewing tube slidably mounted in a steady rest which is contoured to fit a portion of the hand of the examiner and be mounted thereon in a manner to permit the fingers of the hand to grasp the tongue of the subject being examined while the larynx is viewed through the viewing tube.

3,727,606

APNEA DETECTION DEVICE

Ulrich Sielaff, McFarland, Wis., assignor to Airco, Inc., New Providence, N.J.

Filed June 12, 1970, Ser. No. 45,688
Int. Cl. A61b 5/02, 5/10
U.S. Cl. 128—2 S **6 Claims**



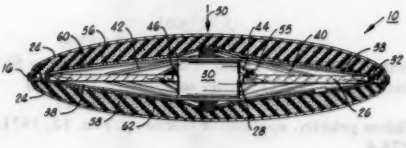
A device for providing continuous monitoring of a human breathing and heart rate wherein a fluid-tight mattress is located in contact with the human and produces pressure signals in response to the breathing and heart rate. A pressure transducer is provided for interpreting the pressure signals for application to an electronic circuit for visual or audible recognition of the signals.

3,727,607

VIBRATORY MASSAGING DEVICE

Onnie R. Dill, P.O. Box 14218, Oklahoma City, Okla.

Filed July 1, 1971, Ser. No. 158,936
Int. Cl. A61h 1/00
U.S. Cl. 128—33 **6 Claims**

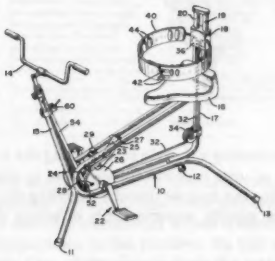


Massaging apparatus of compact character which is capable of imparting distributed vibratory motion to a subject or

specimen, the apparatus consisting of a main frame which is resiliently affixed to a vibratory element, there being resilient suspension relative to the main frame in all dimensions without secure affixure, and the massaging apparatus including a resilient padding overlaying the main frame structure for purposes of providing a decorative outer cover which is soothing to the touch and comforting in support of a subject or specimen.

3,727,608
MASSAGING DEVICE DRIVEN BY EXERCISE APPARATUS

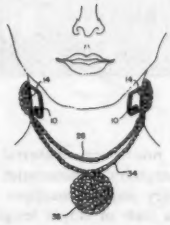
Luther G. Simsian, 7 Laurel Lane, Greenwich, Conn.
Filed Oct. 14, 1971, Ser. No. 189,354
Int. Cl. A61h 7/00
U.S. Cl. 128—63 **16 Claims**



A massaging device comprises a belt which is coupled to an exercise apparatus operated by muscle power. The belt when fastened around a body portion is cyclically tightened and slackened responsive to the motion imparted to the apparatus. The belt may include bulb-like resilient massaging elements which inflate and deflate responsive to applied pressure. Alternatively, the belt comprises stretchable material.

3,727,609
FACE LIFTING DEVICE

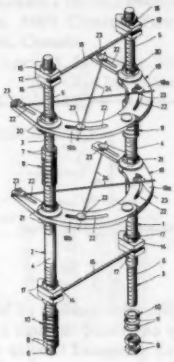
Edith A. Hale, 310 E. 44th Street, New York, N.Y.
Filed July 13, 1971, Ser. No. 162,194
Int. Cl. A61f 5/08
U.S. Cl. 128—76 B **2 Claims**



The application discloses a face lifting device which serves, in addition, as a decorative or ornamental piece of jewelry having the appearance of a necklace. A plurality of elasticised, beaded strands disposed about the back of the neck and connected to an ornamental base located under each ear lobe and attachable to a skin adhering patch provides the principal source of lift. The lift is exerted rearwardly so as to remove wrinkles and excess fat formed about the neck and under the chin. Where the problem of fat and excess skin is especially acute a front necklace may be provided which is weighted to provide additional skin lift.

3,727,610
FIXATOR FOR DIAPHYSES FRACTURES

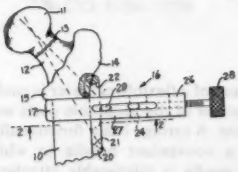
Paolo Riniker, Via Valle Maggia, Locarno, Switzerland
Filed Feb. 17, 1972, Ser. No. 227,132
Claims priority, application Switzerland, March 16, 19 3814/71
Int. Cl. A61f 5/04
U.S. Cl. 128—92 A **5 Claims**



A fixator for diaphyses fractures comprising two fixation nails held between two parallel connection members. Each connection member possesses two parts detachably connected with one another through the agency of at least one spring or resilient element. At the corresponding parts of both connection members there are adjustably and detachably secured, on the one hand, one of the fixing nails and, on the other hand, a support disposed in a plane which is substantially perpendicular to a plane taken through the fixation nails, such support having a respective pair of crosswise arranged fixing wires.

3,727,611
ALIGNMENT MEANS FOR INSERTING GUIDE WIRE PRIOR TO INSERTING HIP NAIL FOR A FRACTURED HIP

Robert Jordan Schultz, 64 Little Brook Road, Wilton, Conn.
Filed July 1, 1971, Ser. No. 158,808
Int. Cl. A61f 5/04
U.S. Cl. 128—92 EB **11 Claims**



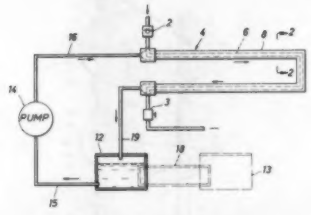
The alignment means includes three novel structures for correctly placing a hip nail in the rounded head of the femur for fracture of the hip. In the use of these structures, a new method of inserting a guide wire in a bone is disclosed. One of the aids is a specially prepared side plate attached to the movable arm of a modified Lowman clamp which is used to designate the correct position for drilling an entrance hole in the lateral cortex of the femur to accommodate the nail and guide wire. Another aid is a wire guide which directs the exploratory wire across the fractured area. The guide wire is used to direct the nail to its best supporting position, and the third is the use of the lesser trochanter as the reference point for the attachment or contact of the instrument, so that the instrument may be used and the procedure performed.

3,727,612

DIALYSIS METHOD AND APPARATUS

Robert S. Sayers, 18710 Prince Williams Lane, Houston, Tex., and Joseph G. Bohorfoush, 293 Youngblood Circle, Milledgeville, Ga.

Filed Jan. 18, 1971, Ser. No. 107,107
Int. Cl. B01d *13/00*
U.S. Cl. 128—214 R 3 Claims



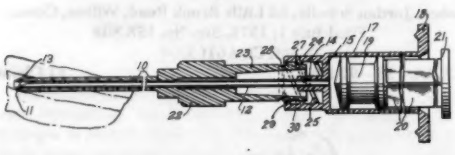
A method of dialytic conditioning of blood in which the blood is continuously circulated through a dialytic exchange member comprising an elongated tubular chamber having at least one semipermeable tubing member longitudinally disposed therein. In a preferred embodiment a plurality of semipermeable tubes are concentrically disposed in the tubular chamber, allowing circulation of blood and one, two or more dialysis fluids simultaneously.

3,727,613

SAFETY CATHETER PLACEMENT ASSEMBLY

James L. Sorenson; Karl A. Pannier, Jr., and Gordon S. Reynolds, all of Salt Lake City, Utah, assignors to Le Voy's Inc., Salt Lake City, Utah

Filed Oct. 9, 1970, Ser. No. 79,403
Int. Cl. A61m *05/00*
U.S. Cl. 128—214.4 14 Claims



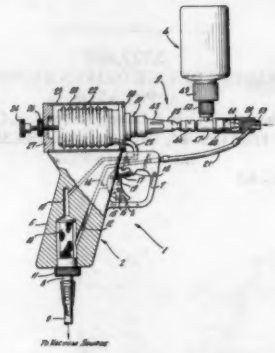
Safe placement of a flexible catheter is enabled by (a) novel positive connection of the separable parts and (b) by unique indicating means. A syringe has a functionally integral needle and provides a convenient handle to which the catheter sheathing the needle is releaseably attached by a smoothly operating twist lock against inadvertent separation during venipuncture and catheter placement manipulation. After venipuncture catheter placement free from danger of damaging a blood vessel lumen wall is effected by advancement of the catheter tip into sheathed relation to the leading end of the needle serving as a stiffener to facilitate advance of the catheter within the lumen. Cooperating means respective associated with the catheter and with the needle and remaining exposed after the catheter and sheathed needle have entered the lumen provide indication of the relative longitudinal position of the catheter end and needle tip, and may also helpfully indicate whether the catheter and needle are safely interconnected against unintentional longitudinal displacement as well as a condition of relative freedom for separation when it is desired to withdraw the needle from the catheter.

3,727,614

MULTIPLE DOSAGE INOCULATOR

Michael Kniazuk, Mountainside, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 13, 1971, Ser. No. 142,957
Int. Cl. A61m *5/18, 1/00*
U.S. Cl. 128—218 A 4 Claims



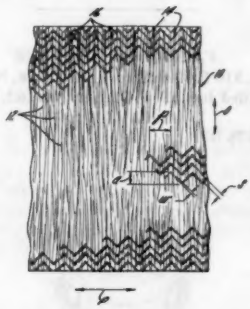
An inoculator having a muzzle surrounding the needle and a vacuum source to urge a piston forward and to draw the skin of the patient into the muzzle thereby impaling the skin of the patient upon the needle, automatically effecting the inoculation.

3,727,615

SOFT, DRAPABLE NONWOVEN MATERIAL

David V. Duchane, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 26, 1971, Ser. No. 202,183
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 W 17 Claims

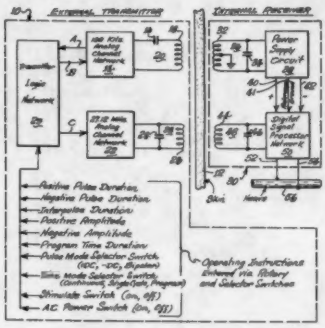


A soft drapable nonwoven material having good bidirectional strength-stretch characteristics which is especially suitable for a sanitary napkin wrapper is described. The material comprises a web of staple length fibers such as a carded web having a predominant direction of fiber orientation and a pattern of adhesive lines serving to unite the fibers together into a coherent nonwoven material. The adhesive lines are uniformly spaced in the direction of fiber orientation and extend continuously across the web generally perpendicular to the direction of predominant fiber orientation. The adhesive lines are also disposed uniformly over the web in a regularly repeating oscillating pattern with the crests pointed in the direction of fiber orientation. The pattern period, line amplitude, and line spacing are carefully selected to insure that as the web is strained in the direction perpendicular to that of original fiber orientation web rupture is avoided over elongations of at least about 25 percent.

3,727,616
ELECTRONIC SYSTEM FOR THE STIMULATION OF BIOLOGICAL SYSTEMS

Herbert H. Lenzkes, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed June 15, 1971, Ser. No. 153,316
Int. Cl. A61n *1/36*
U.S. Cl. 128—422 **9 Claims**

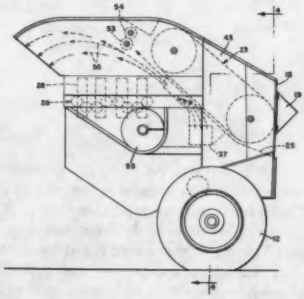


A receiver totally implanted within a living body is inductively coupled by two associated receiving coils to a physically unattached external transmitter which transmits two signals of different frequencies to the receiver via two associated transmitting coils. One of the signals from the transmitter provides the implanted receiver with precise control or stimulating signals which are demodulated and processed in a signal processor network in the receiver and then used by the body for stimulation of a nerve, for example, while the other signal provides the receiver with a continuous wave power signal which is rectified in the receiver to provide a source of electrical operating power for the receiver circuitry without need for an implanted battery.

3,727,617
CORN HARVESTER

Howard C. Hadley, Dallas Center, and Glenn Dale Head, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 25, 1971, Ser. No. 146,714
Int. Cl. A01f *11/06*
U.S. Cl. 130—5 B **6 Claims**

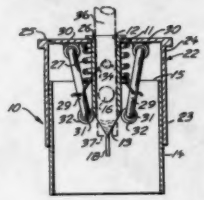


A corn husker of the pull-type composed of a transverse housing structure with the husking bed disposed transversely within the housing, an inlet elevator on one side of the housing that drops the ears of corn onto the upper end of the husking bed and a discharge elevator on the opposite side of the housing that receives the treated corn from the husking bed. A blower is provided as a suitable duct work extending to a pair of outlets, one of which is on the inlet elevator side of the housing and which directs a stream of air through the corn leaving the elevator and gravitating to the husking bed, and the second discharge outlet that is on the opposite side of the housing structure and is directed transversely to pass over the corn laying on the husking bed.

3,727,618
CIGARETTE EXTINGUISHER

Reginald Simpson, 1004 Cloverly Street, North Vancouver, British Columbia, Canada

Filed April 21, 1972, Ser. No. 246,242
Int. Cl. A24f *13/18*
U.S. Cl. 131—256 **5 Claims**

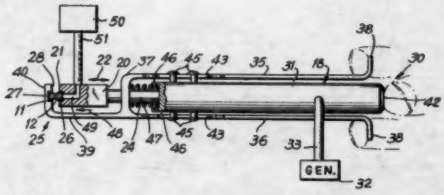


A cigarette extinguisher having a tube adapted to receive a cigarette, lit end first, and having a notched V-shaped end from which the lit end of the cigarette projects and rollers moveable with respect to and over the V-shaped tube end for squeezing and extinguishing the lit end of the cigarette. Bow springs bias the rollers against the exterior of the tube and a coil spring is used to bias the tube with respect to a support and also with respect to the rollers to place the rollers on the tube and beyond the notch, at rest. A stop is provided to limit the insertion of the cigarette and to place the same so as to be engageable by the rollers to extinguish the same.

3,727,619
ULTRASONIC APPARATUS FOR HAIR JOINING

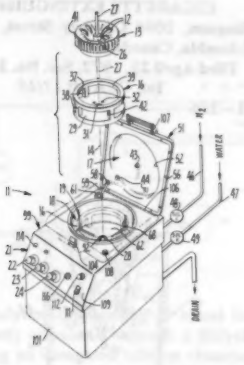
Arthur Kuris, Riverdale, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Division of Ser. No. 885,830, Dec. 17, 1969, Pat. No. 3,642,010. This application Sept. 14, 1971, Ser. No. 180,423
Int. Cl. B29c *27/08*
U.S. Cl. 132—56 **11 Claims**



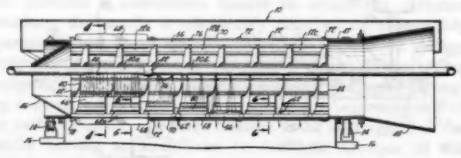
The method and apparatus for joining hair together utilizing ultrasonic vibrational energy in which the overlapping portions of the commercial hair and the live hair are maintained in fixed position to each other when the energy is introduced therein. The hair may be coated internally or externally with a thermoplastic material which acts as the bonding agent.

3,727,620
RINSING AND DRYING DEVICE
Robert F. Orr, Livermore, Calif., assignor to Fluoroware of California, Inc., Fremont, Calif.
Filed March 18, 1970, Ser. No. 20,667
Int. Cl. B08b *3/02*
U.S. Cl. 134—95 **9 Claims**



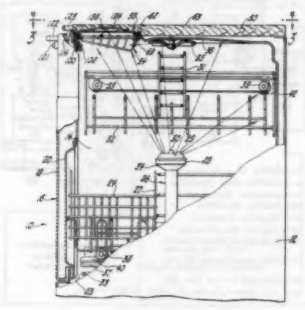
An automatic rinsing and drying device for batch processing of thin wafers such as those used as microelectronic substrates and the like. The wafers are supported in a carrier basket on a rotating member during a programmed cycle of a sprayed rinsing with deionized water and a high speed spin drying sequence during a continuous dry nitrogen purge. The duration of the rinse and drying sequences are independently timed and the speed of revolution during the drying sequence is independently adjustable to suit each batch. The rotating member is encircled by a double walled tub and a hinged lid during the processing cycle. Spray nozzles are positioned over the wafers to apply the rinsing fluid over the faces of the wafers as they rotate thereunder. The tub is Teflon lined and has multiple drain outlets to remove the spent rinse fluid from the cleansed wafer surfaces. Provision is also made for substitution of different sized rotary members to accommodate various basket sizes and wafer loads.

3,727,621
ROTARY WASHER
Robert L. Morton, Santa Ana, Calif., assignor to Pacific Scientific Company, Commerce, Calif.
Filed Feb. 19, 1971, Ser. No. 116,978
Int. Cl. B08b *3/02, 3/06, 17/00*
U.S. Cl. 134—104 **13 Claims**



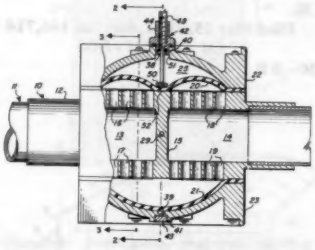
A rotating washer drum is formed with a spiral conveyor on its inner wall for moving small metal parts through the drum while water is sprayed onto the parts. The dirty water drains from the drum through axially extending slots. Eccentrically weighted rods positioned in the slots are oscillated by gravity as the drum rotates, to thereby prevent the slots from becoming clogged with material cleaned from the parts.

3,727,622
DISHWASHER WITH TOP LOADING UTENSIL COMPARTMENT
James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 12, 1971, Ser. No. 198,135
Int. Cl. B08b *3/02*
U.S. Cl. 134—183 **4 Claims**



A cutlery basket being mounted in the washing chamber of a dishwasher for easy access through an auxiliary top opening door hinged to the dishwasher worktop whereby the auxiliary door may be raised without opening the main front door for storing and washing silverware or the like. The top auxiliary door structure provides for cooperative locking and sealing with the main door such that either door may be opened and closed independently of the remaining door.

3,727,623
DIAPHRAGM VALVE
James F. Robbins, Westford, Mass., assignor to Sybron Corporation, Rochester, N.Y.
Filed Nov. 27, 1970, Ser. No. 93,137
Int. Cl. F16k *31/145*
U.S. Cl. 137—1 **14 Claims**

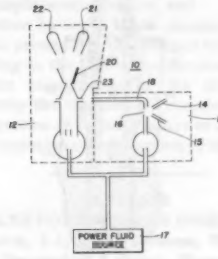


A diaphragm valve is provided with an improved sealing surface and a mechanical flow regulator for precise flow control. The valve has a body with an inlet chamber and an outlet chamber. Passages extend from both chambers to at least one side of the body. The passages are covered by a diaphragm which in turn is covered by a cap. The cap and diaphragm define a control cavity which may be pressurized to force the diaphragm against the side of the body, thereby closing the valve. The openings from the passages are surrounded with ridges, which reduce the effective sealing area against which the diaphragm presses. The cap also supports a mechanical flow regulator which presses the diaphragm towards the body of the valve between the passages from the inlet chamber and the passages to the outlet chamber.

3,727,624
FLUIDIC CIRCUIT COUPLING ARRANGEMENT

Gunther Schubert; Siegfried Muller, both of Dresden; Wolfgang Gobel, Moritzburg, and Christian Hahn, Dresden, all of Germany, assignors to Veb Kombinat Mess-und Regelungstechnik Dessau, Dessau, Germany

Filed May 19, 1971, Ser. No. 144,942
Int. Cl. F15c *1/12, 1/18*
U.S. Cl. 137—81.5 3 Claims

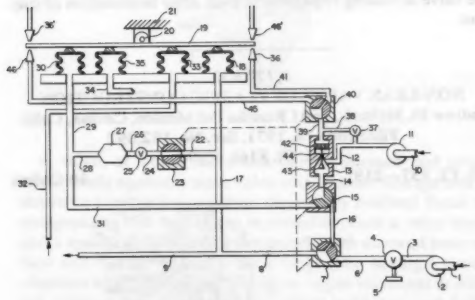


A fluidic circuit in which a turbulence amplifier has a plurality of inputs, and the output of the turbulence amplifier is coupled either directly or by way of suitable adapters to the control input of a fluidic logic device of the type having a wall diffuser.

3,727,625
PNEUMATIC ADJUSTOR

Ryoichi Nagumo, and Noriaki Kitamura, both of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 15, 1971, Ser. No. 198,738
Claims priority, application Japan, Dec. 4, 1970, 45/106806
Int. Cl. F15b *5/00*
U.S. Cl. 137—86 9 Claims

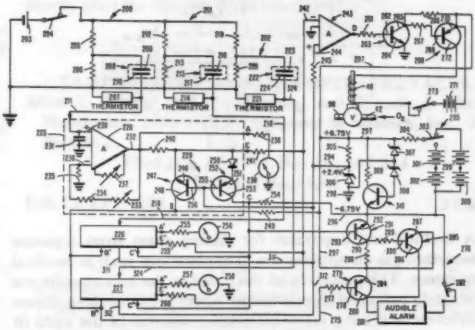


A selective manual and automatic pressure control for feeding desired fluid pressure to a device having a measured fluid pressure feedback line, wherein the automatic operation will equalize or otherwise correlate the feedback pressure and a standard pressure value in steady scate automatic operation, with the improvement being that operation may be switched from manual to automatic without any instantaneous change in the feeding fluid pressure at the moment of switching even though the feedback fluid pressure during manual operation differs from the standard fluid pressure valve. Force or distance outputs of fluid fed transducers are automatically compared by oppositely acting flapper nozzles, with the feeding fluid pressure, feedback fluid pressure, standard fluid pressure, and a selected fluid pressure being fed to respective ones of four transducers. During automatic operation, the selected transducer fluid pressure will be that of the feeding fluid pressure with the interposition of a delay and the output of one flapper nozzle will be amplified to provide the feeding fluid pressure, and during manual operation, the selected transducer fluid pressure will be the amplified output of the other flapper nozzle and the feeding fluid pressure will be manually controlled.

3,727,626
APPARATUS FOR CONTROLLING ENVIRONMENTAL CONDITIONS, ESPECIALLY SUITABLE FOR USE UNDERWATER

John W. Kanwisher, P.O. Box 53, Woods Hole, Mass., and Walter A. Starck, P.O. Box 592, Big Pine Key, Fla.

Division of Ser. No. 780,961, Dec. 4, 1968, Pat. No. 3,556,098.
This application Nov. 4, 1970, Ser. No. 86,991
Int. Cl. A62b *7/02*
U.S. Cl. 137—88 24 Claims



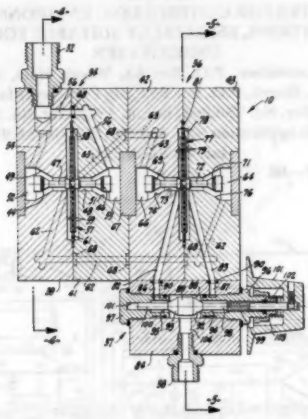
The disclosure illustrates a self-contained closed circuit type underwater breathing apparatus for diver use. A plurality of three or more oxygen sensor cells, each thermistor temperature compensated, are exposed to the gas stream in the system, each providing a current resulting in voltage drop across the thermistor, directly related to oxygen concentration, which voltages then are electronically processed to operate oxygen supply means, whereby oxygen partial pressure is maintained within a predetermined range. In the processing, amplified signal voltages are electronically mathematically averaged and processed to deliver a single control signal to an oxygen solenoid valve. The system is adjusted at atmospheric pressure to provide one half atmosphere oxygen partial pressure at a selected voltage level, e.g., about 2.4 volts average amplified cell voltage. As the quantity of oxygen thereafter varies in use by the diver, the average voltage varies linearly and the solenoid acts responsively thereto. Each amplified cell output is also connected into separate alarm and visual indicator circuitry so that should any cell provide a voltage corresponding to oxygen partial pressure below or above a predetermined safe oxygen range, an audible alarm is sounded and the diver may observe the individual indicators provided for each of the sensor cells and, thereupon, determine emergency remedial steps. Normally, the diver will presume any two similar partial pressure indicators to be correct. The design of the system is such that the electronic circuitry responds to limit, or stabilize, the effect of a spurious voltage input upon the average voltage via transistor clipping circuitry and an associated regulated voltage source. Thereupon a nonvarying voltage, which is not outside the selected saft range constantly appears in the average voltage. Accordingly, the new effective average voltage continues effectively to maintain a suitable oxygen partial pressure as long as the signals from the remaining cells themselves are a correct measure of the oxygen partial pressure actually in the system.

3,727,627

APPARATUS FOR MIXING GASES

Forrest Morton Bird, and Henry Louis Pohndorf, both of P.O. Box 817, Sandpoint, Idaho

Filed July 15, 1970, Ser. No. 54,934
Int. Cl. G05d *11/02*
U.S. Cl. 137—100 **10 Claims**



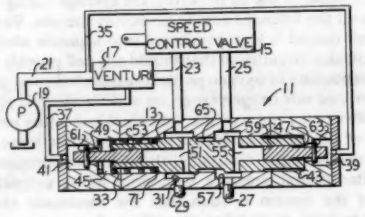
A method and apparatus for mixing gases from separate pressurized gas circuits for use in applications such as medical respirators. The pressures of the gases in the two circuits are accurately balanced to provide an equal pressure drop across a differential mixing valve for precise control of the ratio of flow rates of the gases being mixed. In one embodiment, a double state pressure balancing mechanism is provided for increased accuracy of pressure balance.

3,727,628

UNDERSPEED VALVE HYDROSTATIC CONTROL SYSTEM

Cyril W. Habiger; Donald L. Hopkins, both of Joliet; Gordon W. Johnson, Peoria; William B. Norick, Joliet; Rollin P. Van Zandt, Peoria, and Frank H. Winters, Kellar Heights, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 31, 1970, Ser. No. 68,317
Int. Cl. G05d *11/00*
U.S. Cl. 137—101 **6 Claims**



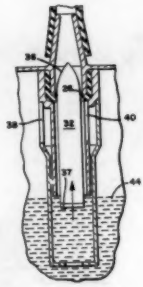
A hydrostatic control system including an underspeed valve which may be used to control the displacement of hydraulic pumps and motors by differential pressure generating means. The underspeed valve has a valve spool which is actuated by a pressure proportional to engine speed, a pressure responsive to a demand speed, and a preset spring biasing pressure.

3,727,629

VACUUM CHECK VALVE

Robert T. Gifford, Yellow Springs, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Dec. 27, 1971, Ser. No. 212,409
Int. Cl. F16k *31/22*
U.S. Cl. 137—205 **14 Claims**



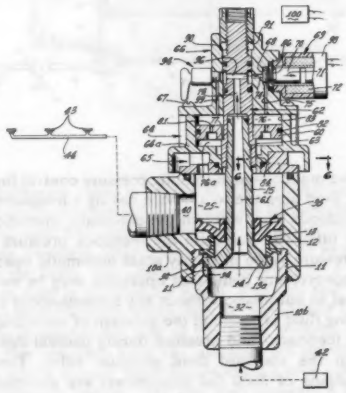
A check valve particularly adapted for use in conjunction with surgical drainage or suction apparatus for operative and postoperative drainage of body cavities. The valve includes a sleeve in which a bouyant float valve having a generally conically shaped upper end is positioned. A thin, flexible diaphragm is mounted in the upper end of the sleeve and has a suction opening through its center. When the level of drained fluid in the collecting vessel rises sufficiently the float valve is lifted upwardly and its generally conically shaped upper end is received in the suction opening through the diaphragm to prevent liquid from entering the suction line. The conical shape of the valve upper end enhances the creation of a low pressure area adjacent the suction opening as the valve moves into proximity to the diaphragm which causes the valve to snap into position during the last portion of its travel. Because of the thin resilient nature of the diaphragm, it is distorted when the valve snaps home, positively gripping and retaining the valve in sealing engagement even after termination of suction.

3,727,630

NON-LEAK VALVE OF PLASTIC CONSTRUCTION

Andrew M. McInnis, 3601 Rancho Del Monico, Covina, Calif.

Filed June 14, 1971, Ser. No. 152,892
Int. Cl. F16k *45/00*
U.S. Cl. 137—218 **10 Claims**



A valve of plastic construction, adapted for manual or automatic operation comprises, in combination,

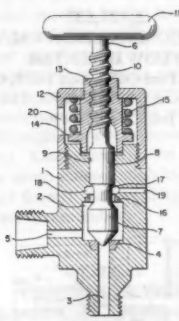
a. a molded plastic chamber including a body and a cap removably carried thereby, there being an annular main seat in the body and a chamber outlet from the body,
b. a stem projecting generally coaxially through the seat with clearance therefrom, and toward the cap at one side of the seat,
c. a stopper carried by the stem to engage and disengage the seat at the opposite side thereof in response to axial bodily displacement of the stem,
d. structure carried by the cap and carrying the stem to effect said displacement thereof, and
e. the chamber having a liquid pressure inlet to communicate said pressure to the stopper for transmitting pressure loading to the seat when the stem is displaced with consequent engagement of the stopper against the seat,whereby the stopper will remain closed against the seat irrespective of liquid pressure or temperature change induced expansion or contraction of the housing.

3,727,631

VALVE FOR PRESSURE INDICATORS

Tadaaki Suezawa, 1-1, Tama 3-chome, Tamano, and Tohru Suzuki, 25, Susanodori 1-chome, Hyogoku, Kobe, both of Japan

Filed Sept. 20, 1971, Ser. No. 181,927
Int. Cl. F16k *11/04*
U.S. Cl. 137—243.2 **3 Claims**



A valve, of which valve disk can be pressed and rotated extra firmly against a main valve seat, against leakage and obstructive combustion residues thereat, by resilient force of a compression type coil spring mounted between a value bonnet and a spindle guide holding the spindle with screwed inner surface and can move axially for a range, also having a draught chamber which co-ordinates with an upper valve seat in letting out residual pressure inside a pressure indicator, and further having a ventilation opening on the side of the bonnet against corrosion of the coil spring.

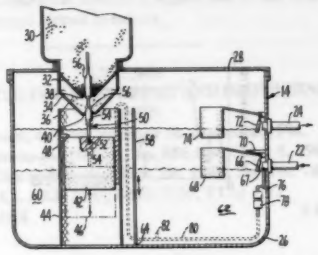
3,727,632

AUTOMATIC CHLORINATOR, PLUNGER SELECTOR TYPE

Andrew L. Pansini, 180 Los Cerros Dr., San Rafael, Calif.

Filed Jan. 18, 1971, Ser. No. 107,141
Int. Cl. E03b *11/00*; E03c *1/046*; F17d *1/00*
U.S. Cl. 137—268 **6 Claims**

This invention is a non-pressurized granular feeder operable due to a change of water levels within the chlorinator. When the filtering system of a swimming pool shuts off the suction power within the above ground piping draws water from the chlorinator back through the pressure line of the system. The pressure or incoming line is located below the suction or normal outgoing line to the chlorinator. This is the only chlorinator of this type, to my knowledge, that allows the chlorine solution to be placed back into the circulation system



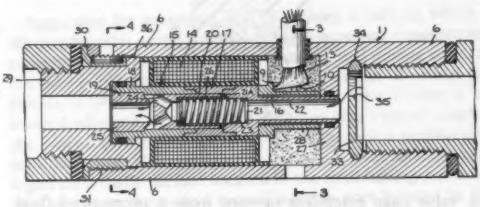
downstream of the pump and filter. This could be accomplished by setting the timer to go off again for a few minutes shortly after the filtering cycle has started.

3,727,633

TAMPER-PROOF SOLENOID OPERATED VALVE

Allan U. Stone, Port Washington, and Francis J. Martin, Huntington, both of N.Y., assignors to Safetech, Inc., Fairfield, N.J.

Filed July 22, 1971, Ser. No. 165,264
Int. Cl. F16k *35/08*
U.S. Cl. 137—382 **3 Claims**



The invention is a solenoid operated valve for use in a vehicle fuel line or any other conduit where it is desired that the valve may be operated only by electric input signals and may not be removed from the line by unauthorized persons or otherwise tampered with. The valve stem is a plunger operated by a surrounding solenoid. The solenoid is adapted for being coupled to a source of power by a tamper-proof cable including terminals concealed in a flowed-in packing material. The valve has a metal protective outer casing which freely rotates on the controlled conduit thereby preventing it from being removed. Removal of the valve from the conduit may be performed by a predetermined arrangement of adjustable portions of the coupling thread which connects the outer metal protective casing to the remainder of the valve. These separate adjustable portions of the thread include a key-receiving means and indexing numbers so that a predetermined code may be used to align the threads to permit the removal of the protective casing.

3,727,634

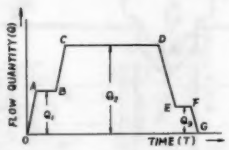
FLOW QUANTITY CONTROLLING APPARATUS

Mitsunori Nishizawa, Kawasaki, and Mahiko Kato, Tokyo, both of Japan, assignors to Tokico Ltd., Kawasaki-City, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 864,420, Oct. 7, 1969, abandoned. This application Nov. 8, 1971, Ser. No. 196,522
Int. Cl. G05d *7/03*
U.S. Cl. 137—486 **5 Claims**

A flow quantity controlling apparatus comprising means for

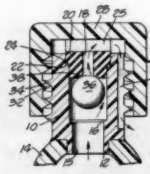
producing air jet pressure in connection with the flow quantity of a liquid flowing in a conduit, means for receiving said air jet



pressure, and means for controlling quantitatively the amount of flow corresponding to the air pressure.

3,727,635
PRESSURE COMPENSATING TRICKLE RATE FLUID OUTLET

Theodore J. Todd, 1039 East Grand Boulevard, Corona, Calif.
Filed July 12, 1971, Ser. No. 161,838
Int. Cl. F16k 15/04
U.S. Cl. 137—513.5 **10 Claims**

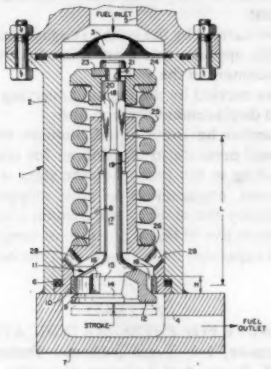


A valve cage extending upward from a pressurized fluid source has a lower inlet valve seat and an upper outlet valve seat. Initiation of flow through the cage lifts a ball from the lower seat to close the upper seat with an initial flushing action and thereafter, with the ball held against the upper valve seat by fluid pressure, the outlet flow is limited to a minute recess in the upper valve seat as long as the valve cage remains in communication with the pressurized source. The valve seat is made of a resiliently deformable elastomer for restriction of the minute recess by a rise in fluid pressure against the ball to compensate for the rise in fluid pressure.

3,727,636
FLOW CONTROL VALVE FOR FUEL INJECTION NOZZLE

Harold C. Simmons, Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Jan. 25, 1971, Ser. No. 109,389
Int. Cl. F16k 17/04
U.S. Cl. 137—541 **5 Claims**

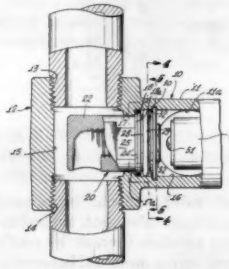
A flow control (or metering) valve characterized in the provision of a combined pintle-spool type valve member in which the pintle valve portion cooperates with a large diameter seat in the housing so as to require large operating forces which, in turn, minimize the effects of friction and hysteresis losses and in which the adjacent spool valve portion is a close sliding fit in the housing bore and has one or more metering slots formed in its periphery to cooperate with the aforesaid seat to meter the flow through the valve with low gain owing to the metering area being independent of the spool size. The valve herein is further characterized in that the spool metering portion is of relatively short axial length and in that the valve member has an elongated small diameter guide portion which is guided in the housing at a zone spaced a substantial distance from the metering portion and seating portion so as to prevent



cocking and sticking of the valve member despite the very close fit between the spool portion and housing bore and a relatively looser fit between the spaced guide portion of the valve member.

3,727,637
REPLACEABLE COMBINATION VALVE SEAT AND FLOW DIVERTER

Richard C. Barkelew, Post Office Box 1415, Carmel, Calif.
Filed Jan. 3, 1972, Ser. No. 214,774
Int. Cl. A47k 4/00
U.S. Cl. 137—561 **10 Claims**



A valve has a valve seating shoulder with an easily replaceable seat held in position adjacent thereto by a special non-circular snap ring, portions of which engage in an annular groove around the liquid passage, and portions of which protrude out of said groove, and over a groove in the rear face of the seat, enabling the snap ring to be easily pried free by use of a suitable tool engaged in the last mentioned groove and forced against the overlapping portion of the ring.

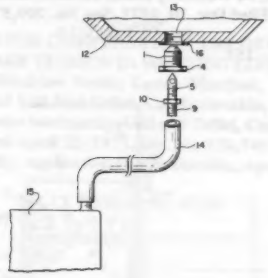
The seat has integral therewith a barrel which passes liquid into a liquid passage and directs it at right angles toward a preselected one of two outlets. The barrel has a non-circular cross section, and is removably but non-rotatably receivable in either of two positions in a mating non-circular aperture in a flange which also provides the aforesaid valve seat shoulder. In one position, the barrel directs water toward one of the outlets, and in the second position, toward the other. The barrel and seat may be readily removed from this aperture, either to inspect or repair the seat, or to reinstall it in the alternative position with the barrel directing the water toward the other outlet.

3,727,638

DRAIN PLUG ASSEMBLY

John P. Zaremba, Jr., Pittsfield; Peter D. Cooney, Lenox; Craig W. Hadden, Pittsfield, all of Mass., and David E. Shupp, Downers Grove, Ill., assignors to Progressive Products, Inc., Pittsfield, Mass.

Filed April 26, 1971, Ser. No. 137,218
Int. Cl. F16n 1/00
U.S. Cl. 137—572 5 Claims



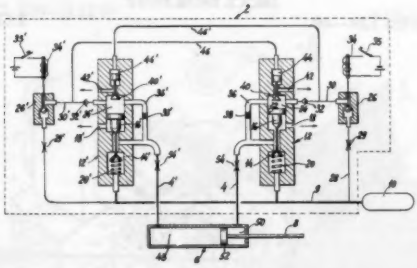
A liquid reservoir drain plug assembly is provided which is particularly suitable for automobile oil pans. The assembly is composed of a pair of plug members, one adapted to receive the other. The first member is tubular with a tapered top portion and adapted to be received by a drainage outlet in the reservoir. The second member is also tubular and adapted to be tightly received by said first member in the tapered portion thereof. The second member has a top and bottom portion, the top portion terminating in a cone and having openings in its sides. Upon loosening the second member, liquid is allowed to flow from the reservoir through the tapered portion of the first member and through the second member via the openings in the top portion. Conveniently, the second member is adapted to receive drain means, such as a hose, and a cover member to prevent foreign matter from entering when it is tightly secured in the first member.

3,727,639

CONTROL DEVICE

Jean Louis Gratzmuller, 66, Boulevard Maurice Barres, Neuilly-sur-Seine, France

Filed Dec. 3, 1971, Ser. No. 204,556
Claims priority, application France, Dec. 10, 1970, 7044461
Int. Cl. F16k 11/00
U.S. Cl. 137—596.16 18 Claims



This invention relates to a two-line hydraulic drive, especially for the control of driving member such as a double-acting hydraulic jack.

A valve adapted both to feed and to drain is mounted on each of the two lines, the valve being hydraulically controlled. One of two control electro-valves, in response to a transient electrical impulse, puts one feed/drainage valve in the feed position and the other feed/drainage valve in the drainage position. The other of the two control electro-valves puts said other feed/drainage valve in the feed position and the first-mentioned feed/drainage valve in the drainage position.

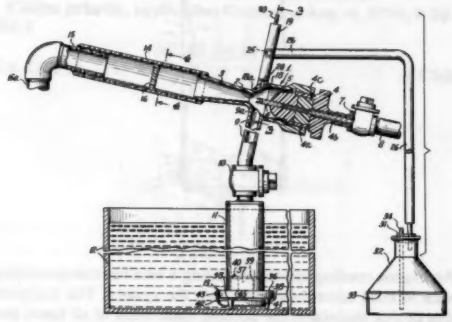
The two-line hydraulic control is applicable to the hydraulic control of electrical circuit breakers.

3,727,640

APPARATUS FOR PREPARING AND DISPENSING DRINKS

Ralph G. Sargeant, 408 W. Windsor St., Lakeland, Fla.

Continuation-in-part of Ser. No. 856,064, Sept. 8, 1969, abandoned. This application Sept. 28, 1970, Ser. No. 76,040
Int. Cl. A23l 1/00; B05b 7/30; F17d 1/12
U.S. Cl. 137—604 5 Claims



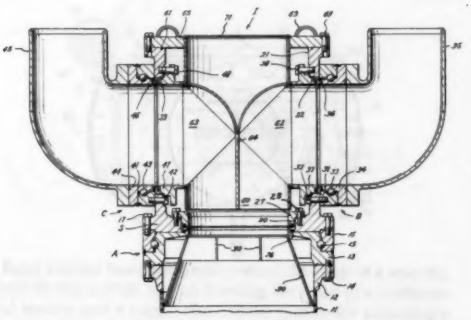
Apparatus for preparing and dispensing drinks, in which a diluting liquid is combined with a liquid beverage concentrate, consisting of a flow confining zone and a final mixing zone. In the flow confining zone, a high velocity stream of one of the liquids is propelled through a discharge tube having a tip located adjacent to the restricted throat of a Venturi causing the other liquid ingredient to be drawn through a suction port into this zone. The preliminary mixture is then forcibly impinged on a baffle surface located in the final mixing zone. Air can be drawn through a second suction port located in the flow confining zone.

3,727,641

LOADING ARM

Albert A. Ashton, Dallas, Tex., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed April 16, 1971, Ser. No. 134,671
Int. Cl. B67d 5/06
U.S. Cl. 137—615 10 Claims



This patent discloses a loading arm in which packing in the swivel joints at the upper end of the riser pipe and at the innermost ends of the inner arms may be readily changed or serviced without disassembly of any of the swivel joints.

3,727,642

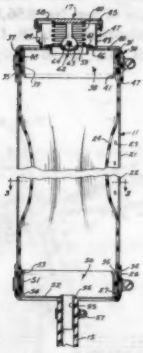
VACUUM COMPENSATING DEVICE FOR ENGINE COOLING SYSTEM AND METHOD OF INSTALLING SAME

Allie B. Holmes, Corpus Christi, Tex., assignor to Opti-Cap Inc., Corpus Christi, Tex.

Division of Ser. No. 762,254, Sept. 16, 1968, Pat. No. 3,521,702. This application March 9, 1970, Ser. No. 17,620

Int. Cl. F16l 55/04

U.S. Cl. 138—30 **4 Claims**



An engine cooling system including a vacuum compensating device in fluid communication with the system. The compensating device maintains the cooling system full at all times and reduces stress on the system. A viewing device is substituted for the usual cap on the radiator filling neck to allow visual determination of the coolant level, and the viewing device seals the radiator. The invention also includes a unique vacuum compensating device including a flexible liner, a method of installing a fitting on the radiator to connect the compensating device to the radiator, and unique brackets to mount the compensating device on the wall of the engine compartment adjacent the radiator.

3,727,643

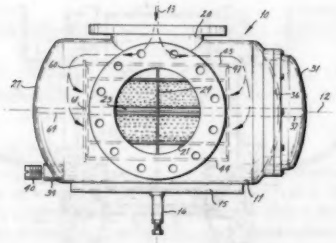
LIQUID FLOW DIFFUSION AND STRAIGHTENING APPARATUS

Joseph J. Blackmore, R.R. No. 1, Edwardsville, Ill., and Perry G. Glunt, 91 Wildwood Lane, Kirkwood, Mo.

Filed Nov. 17, 1971, Ser. No. 199,416

Int. Cl. F16l ; F15d

U.S. Cl. 138—41 **8 Claims**



Liquid flow diffusion and straightening apparatus, especially useful to provide an even velocity profile for water entering the pump of a circulation system. A cylindrical housing has a cross-sectional plane of symmetry on which the flow inlet and outlet are located, there being an interior chamber leading to the outlet. The inflowing water is divided into halves which flow away from the plane of symmetry and are slowed within the housing ends. The flows then enter the interior chamber through the ends of cylindrical diffusion screens, pass therethrough, and are rejoined inwardly of the flow outlet.

3,727,644

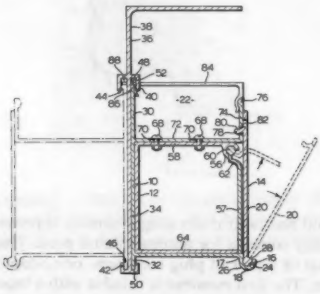
LAY-IN CABLE DUCTING ASSEMBLIES

David Kagan, 14 Wenndley Road, Toronto, Ontario, Canada

Filed Dec. 20, 1971, Ser. No. 209,570

Int. Cl. F16l 9/18

U.S. Cl. 138—155 **8 Claims**



A lay-in cable channel section has a gate as one of its lateral walls which is hinged along the bottom edge, the novel hinge providing the gate with enough strength to act as a supporting platform for materials alongside the cableway. The hinge is also designed so as to permit the gate to stay vertically closed when raised. The cable channel sections are united by coupling sections of similar cross-section but these have suspended gates so seal off any static gap. Above the interior cableway is an open cableway. Novel hangers permit the channel sections to be suspended in side-by-side pairs. A section can be simply lifted out of the hanger and by a reverse movement returned to be positively held by way of upper and lower flanges.

3,727,645

WILTON CARPET LOOMS

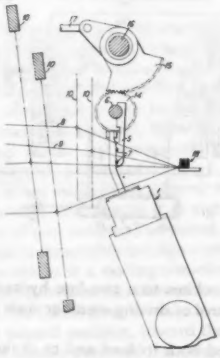
John Bernard Jowett, Cookley, near Kidderminster, England, assignor to Brintons Limited, Kidderminster, England

Filed June 21, 1971, Ser. No. 155,039

Claims priority, application Great Britain, June 25, 1970, 30,937/70

Int. Cl. D03d 39/12

U.S. Cl. 139—40 **2 Claims**



A Wilton carpet loom is fitted with a movable guide which cooperates with the sley to define a passage across the width

of the loom for the insertion of each successive pile wire. Mechanism is provided for moving the guide out of the path of the inserted wire during the beat-up movement of the sley and for returning it to its operative position in relation to the sley prior to the insertion of the next wire. The guide is preferably constituted by spaced fingers each formed with a guide slot and extending downwardly from a cross-member mounted to rotate so as to swing the fingers into and out of their operative position in relation to the sley.

3,727,646

APPARATUS FOR COMPENSATING THE DEVIATIONS OF WARP TENSION IN WEAVING LOOMS

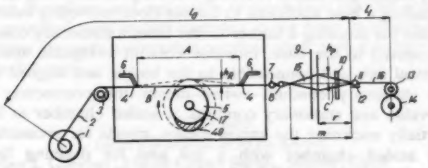
Milos Mares; Stanislav Nosek; Lumir Martinek, and Vaclan Rohlena, all of Usti Nad Orlici, Czechoslovakia, assignors to Vyskumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed April 23, 1971, Ser. No. 136,746

Claims priority, application Czechoslovakia, April 28, 1970, 2944/70

Int. Cl. D03d *49/14, 47/26*

U.S. Cl. 139—97 **13 Claims**



Apparatus for compensating the deviations of warp tension in weaving looms, especially weaving looms with simultaneous picking of weft threads into warp. Two parallel guiding support bars, spaced longitudinally of the warp, are arranged across the plane of the warp on one side thereof, said bars being provided with support edges. On the other side of the warp, opposite the portion of the warp limited by the support edges of the support bars, a warp deflecting member is arranged, said member working in counter phase with the device creating the shed.

3,727,647

WEFT THREAD SELECTING AND HANDLING MEANS FOR GRIPPER SHUTTLE LOOM

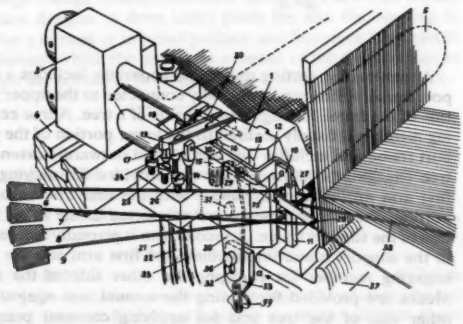
Claude Laval, Castres, France, assignor to Lebocey Industrie, Societe Anonyme, Troyes (Aube), France

Filed July 2, 1971, Ser. No. 159,140

Claims priority, application France, Feb. 12, 1971, 7105849

Int. Cl. D03d *47/38*

U.S. Cl. 139—122 W **9 Claims**



Shuttle loom weft thread handling mechanisms cooperating to cut, hold and facilitate shuttle pickup of the proper sequence of weft threads. A plurality of external thread spools supplies different weft threads at each side of the fabric to the shuttle which sequentially and reciprocally carries them through the shed between the fabric edges. At the conclusion of each shuttle pass, the leading end of the weft thread is dislodged from the shuttle pincer hook. Simultaneously, a weft feed means selects the next weft thread to be inserted and presents it to the cut and hold assembly which cuts it and grips the spooleattached end in position to be snagged by the shuttle pincer hook on the shuttle's next pass.

3,727,648

WEAVING OF RIBBONS

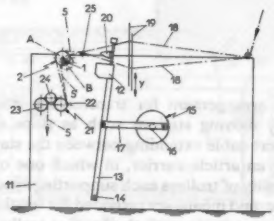
Erich Essig, Frick, Switzerland, assignor to Jakob Muller, Frick, Switzerland

Filed July 30, 1971, Ser. No. 162,118

Claims priority, application Germany, Aug. 4, 1970, P 20 38 601.1

Int. Cl. D03d *49/22*

U.S. Cl. 139—291 R **9 Claims**



Ribbons are woven and then withdrawn tautly in a specific path. When, in response to the occurrence of a weaving fault, the ribbons undergo displacement in the general plane temporarily so that slack will temporarily occur in the respective ribbon permitting the latter to return or be returned to its original position in the path.

3,727,649

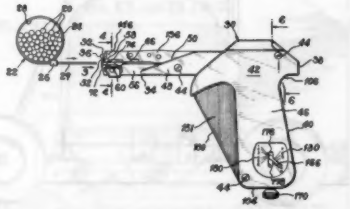
HAND TOOL FOR TENSIONING AND CUTTING WIRE TIE STRAPS

Edward A. Obuch, Linden, and William T. Waddington, Fanwood, both of N.J., assignors to Buchanan Electrical Products Corporation, Union, N.J.

Filed July 6, 1971, Ser. No. 159,621

Int. Cl. B21f *9/02*

U.S. Cl. 140—93.2 **21 Claims**



A hand tool for tensioning and cutting the strap of a wire tie, the tool having a draw bar for drawing the strap to a predetermined tension and a toggel-like linkage system for actuating a strap cutting means when the strap is drawn to a predetermined tension. Means are provided for selectively adjusting the predetermined tension in finite fixed increments and for providing a vernier or fine adjustment of the predetermined tension with reference to each finite fixed increment. An

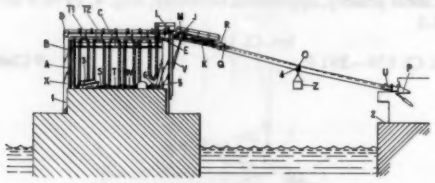
operating lever adapted to actuate the toggle-like linkage system is pivotally attached to the tool's handgrip near the remote bottom portion thereof so that the pivot point of the actuating lever is generally located below the operator's hand when the tool is in operation.

3,727,650

TRANSFER ARRANGEMENTS

David John Ingram, and Keith James Mitchell, both of Kent, England, assignors to The General Electric Company Limited, London, England

Filed Feb. 22, 1971, Ser. No. 117,482
Int. Cl. B65b *3/04*
U.S. Cl. 141—98 **12 Claims**



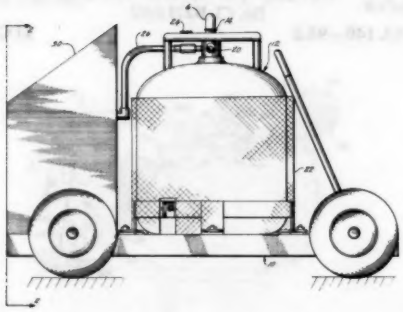
A transfer arrangement for transferring articles between two relatively moving stations such as ships under way in which a support cable extending between the stationsprovides a support for an article carrier, in which one of the stations carries a plurality of trolleys each supporting spaced regions of a flexible hose, and means are provided for feeding the trolleys on to the support cable until the leading trolley reaches the other station to permit the transfer of fluids between the stations, the movement of the intermediate trolleys being thereafter controlled in dependence upon variations in the distance between the stations to maintain a substantially uniform spacing between them.

3,727,651

PORTABLE HIGH VOLUME GAS SUPPLY SYSTEM

Robert E. Biever, 3247 East Charlinda, West Covina, Calif.

Filed March 17, 1971, Ser. No. 125,250
Int. Cl. B65b *3/04*
U.S. Cl. 141—231 **10 Claims**



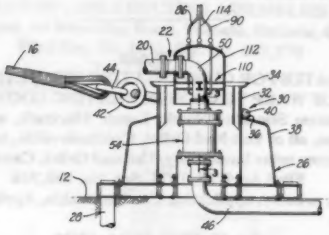
There is provided a mobile system for dispensing a gas generated as a consequence of vaporization of a cryogenic fluid at high volumetric flow rates and at temperatures approaching ambient. The system consists of a cart-mounted container for a cryogenic fluid and a gas dispensing system having, as a part thereof, a contained and protected primary heat transfer coil secured to a secondary heat transfer surface which is a part of the cart.

3,727,652

SUBMERGED TANKER MOORING AND CARGO TRANSFERRING SYSTEM

David G. Reynolds, 13952 Dunton Drive, Whittier, Calif.

Filed Dec. 2, 1970, Ser. No. 94,394
Int. Cl. B65b *1/04*, *3/04*
U.S. Cl. 141—387 **5 Claims**



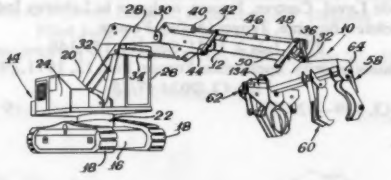
A submerged tanker mooring and cargo transferring system including a base anchored to the sea floor, swiveling mooring means for mooring a tanker to the base, a stationary conduit connected to the base, movable conduit swingable about a vertical axis and connectible to the tanker and aligned with the stationary conduit, swivel means interconnecting the movable and stationary conduits, a sealed chamber at least partially enclosing the swivel means, means for pressurizing the sealed chamber with a gas and for draining liquid therefrom into one of the conduits, a bell movable with the movable conduit above the swivel means, and means extending from the bell to the surface for sampling the liquid in the bell to detect leakage of fluid from the swivel means.

3,727,653

TREE CUTTING APPARATUS

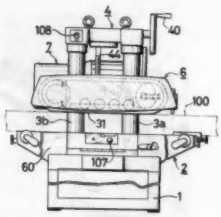
Frank J. Tucek, Wausau, Wis., assignor to Drott Manufacturing Corporation

Division of Ser. No. 781,899, Dec. 6, 1968, Pat. No. 3,575,222.
This application March 15, 1971, Ser. No. 124,244
Int. Cl. A01g *23/08*
U.S. Cl. 144—34 E **5 Claims**



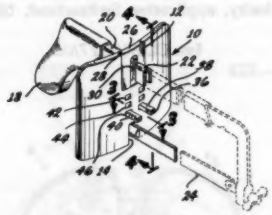
Apparatus for cutting trees. The apparatus includes a support frame. A first arm is pivotally connected to the upper portion of the frame for engaging one side of a tree. A tree engaging member is fixedly secured to the lower portion of the support frame and includes first and second outwardly extending tree engaging portions. Means are provided for moving the first arm into spaced alignment with the first tree engaging portion. Tree cutting means are connected to the lower portion of the support frame. A second arm is pivotally connected to the support frame intermediate the first arm and the tree engaging member for engaging the other side of the tree. Means are provided for driving the second arm against the other side of the tree and for applying constant pressure thereto before, during, and after cutting the tree so as to maintain the tree under control of the tree cutting apparatus at all times.

3,727,654
PLANER MACHINE
Nakataro Mochizuki, Shizuoka, Japan, assignor to Marunaka Tekkosho Inc., Shizuoka-shi, Japan
Filed April 21, 1971, Ser. No. 136,079
Int. Cl. B27c 1/12
U.S. Cl. 144—120 **4 Claims**



A carpenter planer, having a lower stationary assembly mounting a stationary, yet adjustable cutter, and an upper movable assembly including a drive motor, an endless belt driven therefrom and a plurality of stock-feed parallel rollers are provided, said upper assembly being kept in suspended position through a rotatable vertical shaft and a spring attached thereto.

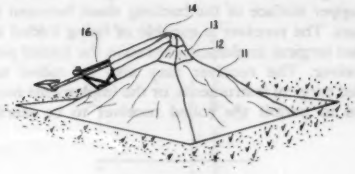
3,727,655
GUARD SHIELD FOR SAWS
Harlan J. Garcher, 15618 Cobalt Street, Sylmar, Calif.
Filed Dec. 17, 1971, Ser. No. 209,203
Int. Cl. B27b 21/00
U.S. Cl. 145—35 R **6 Claims**



A guard shield removably attachable to saws such as for example hack saws. The guard shield is removably attachable to the vertical frame member which is forward of the saw grip. It is a curved plastic shield with spaced openings to variably receive the legs of a U-clamp or clip that attaches the shield to the frame member. At the top of the shield is an opening for the top frame member of the saw to pass through. The opening is large enough to adapt the shield universally to a wide variety of saw designs. A dove tailed piece fits into the opening in either a normal or inverted position and this piece has a slot in it through which the top frame member of the slot can pass in either the normal or inverted position of the removable piece.

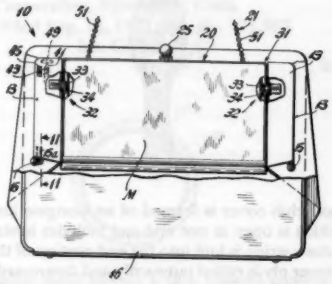
3,727,656
GRAIN STORAGE
David John Luders, 81 Sampson Street, Orange, Australia
Filed Sept. 15, 1970, Ser. No. 68,369
Claims priority, application Australia, Sept. 19, 1969, 61083/69
Int. Cl. B65d 1/00
U.S. Cl. 150—1 **6 Claims**

A grain or other discrete form material storage device formed from a foldable (flexible) synthetic plastics sheet material. The storage device has a base which would normally rest upon the ground and a peripheral side wall which tapers upwardly to an access opening at the apex of the wall. The wall is disposed at an angle to the base, when the device is



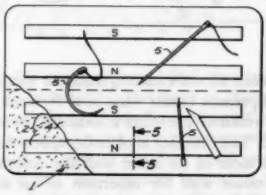
charged with stored material, which is approximately equal to the normal angle of repose of the stored material.

3,727,657
HANDBAG WITH BREAK-AWAY PURSE
Earle H. Landis, 940 President Ave., Toms River, N.J.
Filed April 6, 1971, Ser. No. 131,644
Int. Cl. A45c 1/00
U.S. Cl. 150—35 **4 Claims**



A handbag having a break-away purse therein which is normally secured in the handbag by releasable means and has carrying strap means projecting therefrom for supporting said purse and connected handbag, said releasable means providing for separation of said purse and handbag in the event of an abnormal pull on the handbag while supported by said carrying strap means.

3,727,658
RECEIVER FOR SURGICAL IMPLEMENTS
John D. Eldridge, Jr., Anaheim, Calif., assignor to Instranetics, Inc., Los Angeles, Calif.
Continuation-in-part of Ser. No. 868,317, Oct. 22, 1969, abandoned. This application Sept. 22, 1971, Ser. No. 182,731
Int. Cl. A61b 19/00
U.S. Cl. 150—52 R **9 Claims**



A receiver for surgical implements which includes a backing sheet of a foamed elastomer, the back side of which is exposed to provide frictional contact with an underlying surface. A

plurality of magnetic bars are disposed on the upper surface of the pad backing sheet to receive and retain surgical implements. An impervious plastic cover sheet, coextensive with the backing sheet, conforms to the magnetic bars and adheres to the upper surface of the backing sheet between the magnetic bars. The receiver is capable of being folded to entrap discarded surgical implements between the folded portions of the receiver. The receiver may also be rolled to entrap discarded surgical instruments, or the implements may first be removed to permit the rolled receiver to be sterilized for reuse.

3,727,659

KNIT GOLF CLUB COVER

Archie W. Shuford, P. O. Box 427, Hickory, N.C.

Filed Dec. 27, 1971, Ser. No. 212,194

Int. Cl. B65d *65/02*

U.S. Cl. 150—52 G **5 Claims**

The golf club cover is formed of an elongate knit seamless sleeve which is open at one end and includes inner and outer plies. A draw string is knit into the end portion of the inner ply and the inner ply is rolled outwardly and downwardly over the outer ply and drawn inwardly to close one end of the sleeve and form an enlarged knob-like roll closure on the closed end of the golf club cover.

3,727,660

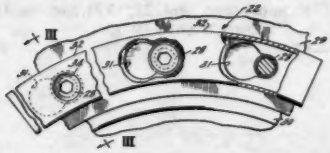
BOLT RETAINER AND COMPRESSOR EMPLOYING SAME

Joseph C. Burge, Cincinnati, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed Feb. 16, 1971, Ser. No. 115,273

Int. Cl. F16b *41/00*

U.S. Cl. 151—69 **6 Claims**



The disclosure shows a sealing member secured to the inner end of a compressor stator vane row by bolts and nuts. One form of bolt retainer prevents a loosened bolt from entering the flow field. The retainer is of hollow, box-like cross section with keyhole slots in its inner wall for assembly and access holes in its outer wall for insertion of an allen wrench to torque the bolts. Another form of bolt retainer provides access to the outer portion of the bolt heads so that they may be tightened and loosened. A third form of retainer may be assembled laterally and comprises a plate and retainer lugs for the bolts.

3,727,661

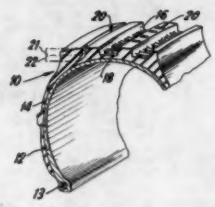
TIRE TREAD

Gilbert J. Hoke, Kenmore, N.Y., assignor to Dunlok Tire and Rubber Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 750,387, June 27, 1968, abandoned. This application Feb. 18, 1971, Ser. No. 116,328

Int. Cl. B60c *11/10*

U.S. Cl. 152—209 **17 Claims**



A pneumatic tire is provided with a tread having a traction pattern consisting of grooves. The tread pattern inhibits stone penetration within the tread by suspending or cradling the stone spatially from the bottom of the groove. The grooves are provided with transverse crossbars or buttresses having a configuration and dimension relative to the groove to support or cradle a stone above the bottom of the groove.

3,727,662

VEHICLE ANTI-SKID DEVICE

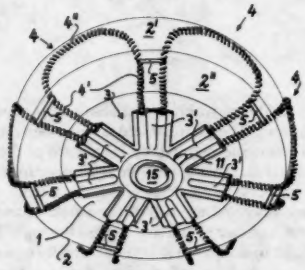
Fritz Muller, Gruneggstrasse 38b, 6000 Luzern, Switzerland

Filed Feb. 12, 1971, Ser. No. 114,806

Claims priority, application Switzerland, March 9, 1970, 3402/70

Int. Cl. B60c *27/02*

U.S. Cl. 152—222 **6 Claims**



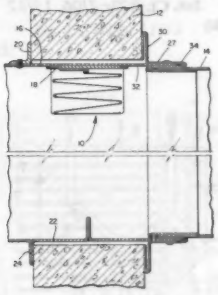
An anti-skid device for vehicles which comprises a support which can be attached to a part of the vehicle, typically the wheel, the hub or to the wheel axle, and at which support there are attached both ends of a number of anti-skid elements, in the form of helical spring brackets or straps which extend in substantially star-like configuration from the support and are flexed over the tread of the tire. According to an important aspect of the instant development at the region of the side wall of the tire and near the tread thereof, there is provided a respective connection element which extends in the peripheral direction of the tire between each two neighboring resilient arms of the helical spring brackets or straps, but between resilient arms which do not belong to the same helical spring bracket or strap.

3,727,663

DEVICE FOR MOUNTING FIRE DAMPER

Franics J. McCabe, Regency Woods H-16, Doylestown, Pa.

Filed Jan. 25, 1971, Ser. No. 109,460
Int. Cl. E06b 3/94
U.S. Cl. 160—84 R **5 Claims**



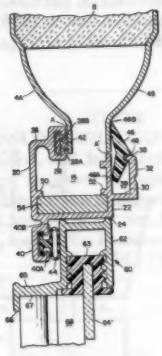
An adapter means is provided for mounting a fire damper in a wall, for positioning the fire damper in its mounted condition, and for connecting it to duct work. The device comprises one or more sheet metal members coextensive with a portion of the fire damper which has been bent to engage the wall and the duct work.

3,727,664

DOOR ASSEMBLY

Anthony R. Mennuto, 769 Pascack Road, Paramus, N.J.

Filed March 2, 1972, Ser. No. 231,136
Int. Cl. E06b 3/32
U.S. Cl. 160—90 **10 Claims**



A door assembly includes a core sandwiched between a pair of one-piece panels. Portions of the panels surround an opening and a frame retains the panel portions to define the opening and supports an insert therein.

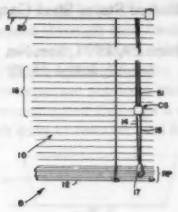
3,727,665

BLIND HAVING LIFT CORDS AND A CORD LOCK

Victor Debs, Staten Island, N.Y., assignor to Levolor Lorentzen, Inc., Hoboken, N.J.

Filed May 5, 1871, Ser. No. 140,376
Int. Cl. E06b 9/26
U.S. Cl. 160—178 C **15 Claims**

A blind has lift cords which pass through a cord lock and hang down to be pulled downwardly and eased upwardly to raise and lower the blind. The down-hanging lift-cords are guided by a pendant cord-guide which is attached to and carried by an actuating cord that is connected to the locking dog



of the cord lock. When the actuating cord is pulled it moves the locking dog into locking engagement with the lift cords, causing the cord lock to lock the cords.

3,727,666

METHOD OF CASTING USING A MOLD HAVING A REFRACTORY COATING THEREON

Jay Lee Vander Sluis, Grand Haven, Mich., assignor to Howmet Corporation, Greenwich, Conn.

Filed Aug. 16, 1971, Ser. No. 171,982
Int. Cl. B22c 3/00
U.S. Cl. 164—72 **8 Claims**

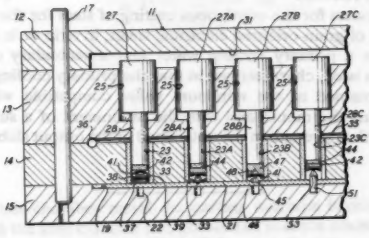
A metal ingot mold having a thin bonded coating on the mold surface of a finely divided refractory material.

3,727,667

SINGLE SET-UP SEQUENTIAL HEAT PROCESS FOR MAKING DIAMOND HEAT SINKS

Graham H. Bell, 1311 Lucinda Way, Tustin, Calif.

Filed Nov. 30, 1971, Ser. No. 203,192
Int. Cl. B22d 23/06, 19/06
U.S. Cl. 164—80 **12 Claims**



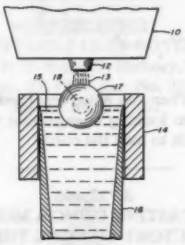
A multiple-cavity mold with vertical cavities receives a layered "stack" in each cavity. The stack or charge includes a diamond crystal, a brazing metal alloy and a casting metal slug all of which are impinged upon by a tungsten rod which may or may not become a part of the final stack assembly. The mold is evacuated and the contents heated in temperature stages or steps such that the brazing alloy melts before the casting slug. The temperature is then diminished at a rate to anneal the casting metal in the assembly. Preferably the brazing alloy is a combination of a transitional metal with a noble metal. The casting metal is of a superior heat-conducting material, such as copper or silver, and may be alloyed.

3,727,668

METHOD AND APPARATUS FOR POURING LIQUID METAL INTO A CONTINUOUS-CASTING MOLD

David K. Griffiths, Penn Hills Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed June 29, 1971, Ser. No. 158,028
Int. Cl. B22d 11/10
U.S. Cl. 164—82 5 Claims



A method and apparatus for pouring a stream of liquid metal into a continuous-casting mold. A body which has a convexly curved surface (for example a sphere) and is of essentially inert material floats in the pool of liquid metal in the mold. As a stream of liquid metal is poured into the mold, it impinges on the surface of the floating body and thus enters the pool in a quiescent state. The body remains centered under the stream through the action of natural forces.

3,727,669

PROCESS FOR CONTINUOUS CASTING OF STEEL FOR MAKING GRAIN-ORIENTED ELECTRICAL SHEET IN STRIP OR SHEETS

Paolo Arbitrio; Sandro Basevi; Alfredo Fornari, and Antonio Sensi, all of Terni, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., and Terni Societa'Per L'Industria E L'Elettricita S.p.A., both of Rome, Italy

Filed Dec. 28, 1970, Ser. No. 102,038
Claims priority, application Italy, May 19, 1970, 50.811 A/70
Int. Cl. B22d 11/12
U.S. Cl. 164—89 6 Claims

A process for the continuous casting of steel for the manufacture of grain-oriented electrical sheet, in strip or in sheets, wherein a primary cooling water and a secondary cooling water is used, characterized in that the primary cooling water is maintained at the minimum value compatible with not damaging the mould and with the attainment of a sufficient mechanical strength in the outer shell of the output slab.

3,727,670

LEACHABLE CERAMIC CORES

Joseph T. Bailey, Chattanooga, Tenn., assignor to American Lava Corporation, Chattanooga, Tenn.

Division of Ser. No. 739,156, June 24, 1968. This application May 27, 1971, Ser. No. 147,504
Int. Cl. B22d 29/00
U.S. Cl. 164—132 3 Claims

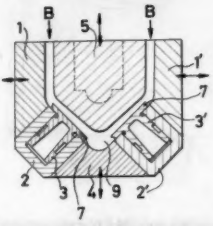
Ceramic cores having at least sufficient zinc oxide to provide essential continuity throughout the structure are provided. Such cores are included in metal castings from which they are leached under acidic or alkaline conditions to provide cavities within the castings.

3,727,671

PATTERN ASSEMBLY FOR A FOUNDRY CORE UNIT FOR CASTING A CYLINDER BLOCK OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Kiyomitsu Kawai, Osaka, Japan, assignor to Kabushiki Kaisha Toyoda Jidushokki Seisakusho, Kirayashi, Japan

Filed Sept. 7, 1971, Ser. No. 177,936
Claims priority, application Japan, Sept. 7, 1970, 45/78321
Int. Cl. B22c 7/06, 13/12
U.S. Cl. 164—230 1 Claim



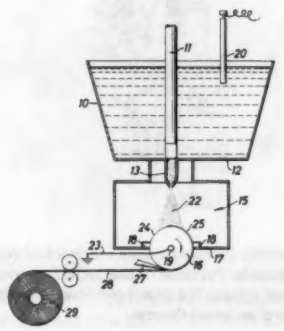
The core-making pattern assembly is comprised of two side pattern members having a plurality of recesses corresponding to the number of cylinders in a V-type internal combustion engine. A movable member is mounted in each recess and carries a core section for shaping an engine cylinder bore.

3,727,672

FORMATION OF STEEL STRIP

Hugh Willmott Grenfell, Swansea, Glamorgan, Wales, assignor to The Steel Company of Wales Limited, Glamorgan, Wales

Division of Ser. No. 818,299, April 22, 1969, Pat. No. 3,576,207. This application Dec. 4, 1970, Ser. No. 95,339
Int. Cl. B22d 11/10
U.S. Cl. 164—281 4 Claims



The present invention relates to a process for the continuous casting of metal strip, which process comprises imparting an electrostatic charge of at least 80,000 volts to a stream of molten metal, passing the stream of metal through a nozzle into an inert atmosphere and allowing the stream leaving the nozzle to atomise to a fine spray, collecting the spray droplets on a cool receiving surface to form a layer of metal on said surface and continuously stripping the layer of metal from said surface.

3,727,673

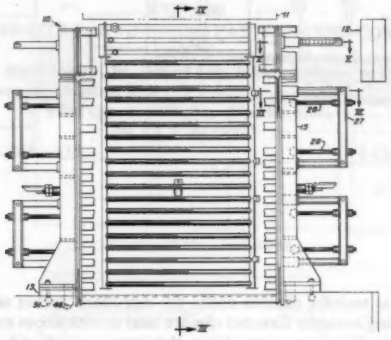
ROLLER CAGE FOR CONFINING CONTINUOUS CASTING AS IT EMERGES FROM MOLD

Francis Gallucci, Irwin, Pa., assignor to United States Steel Corporation

Continuation-in-part of Ser. No. 1,485, Jan. 8, 1970, abandoned, which is a division of Ser. No. 708,660, Feb. 27, 1968, Pat. No. 3,538,980. This application May 21, 1971, Ser. No. 145,943

Int. Cl. B22d *11/12*

U.S. Cl. 164—282 **2 Claims**



A cage for confining a slab casting descending from a tubular flow-through mold is constituted by spaced opposed banks of rollers engaging both the broad faces and the edges of the slab. The rollers are journaled in side and end frames bolted together forming an enclosure open at the top and bottom. Cooling-spray nozzles extend between adjacent rollers of all banks. The cage stands on a fixed support and keys and keyways on the contacting surfaces thereof effect exact relative positioning. These surfaces also have self-sealing joints in pipe lines supplying water to manifolds on which the nozzles are mounted.

3,727,674

LOW-PRESSURE CHILL-CASTING DEVICES

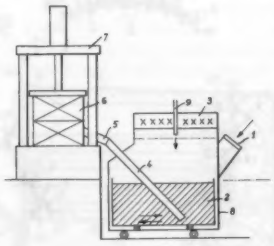
Pierre Rene Chatourel, and Jean Henri Lefebvre, both of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine), France

Filed June 22, 1970, Ser. No. 47,978

Claims priority, application France, Aug. 6, 1969, 6927058

Int. Cl. B22d *17/06*

U.S. Cl. 164—306 **6 Claims**



A device for chill-moulding light alloy castings under low-pressure conditions, which comprises a fluid-tight enclosure, a crucible disposed within said enclosure and adapted to be filled with molten metal, a mould made of several sections assembled either to the upper plate or to the lower plate of a press, a casting tube and its joint means providing a fluid connection between said crucible and said mould, said device operating in response to the development of the air pressure within said enclosure so as to force the molten metal from said crucible into said mould through said casting tube, means for developing the air pressure within said enclosure, characterized in that said fluid-tight enclosure and said moulding device consist of two separate sections movable in relation to each other and interconnected through a casting duct and its connecting tube both easy to remove and heat.

3,727,675

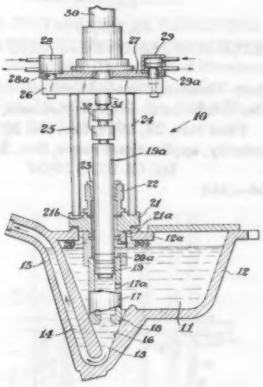
APPARATUS FOR ALIGNING AND SEATING THE SHOT CYLINDER IN A METAL DIE CASTING MACHINE

Foster C. Bennett, Columbus, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 116,915, Feb. 19, 1971, abandoned. This application June 28, 1972, Ser. No. 267,085

Int. Cl. B22d *17/04*

U.S. Cl. 164—316 **7 Claims**



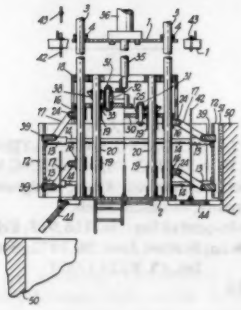
A hot chamber metal die casting machine is disclosed in which the shot cylinder and gooseneck seat are constructed of dissimilar materials which have substantially different thermal characteristics. Means are provided which Vertically align the shot cylinder in the gooseneck seat and which hold the lower end of the cylinder in sealing contact with the gooseneck seat during the shot-making operation. Another means is provided for vertically aligning the shot piston in the shot cylinder. Additional means are provided for disengaging the shot cylinder from the gooseneck seat at the end of a production period before the gooseneck seat is allowed to cool down. The various alignment, hold-down and disengagement means automatically compensate for the differential in expansion which occurs between the shot cylinder and gooseneck seat and thereby greatly improve the casting operation.

3,727,676

APPARATUS FOR USE IN LINING CAVITIES

Kenneth Thomas Eccleston, Nechells, England, assignor to Foseco International Limited, Birmingham, England

Filed April 1, 1971, Ser. No. 130,429
Claims priority, application Great Britain, April 1, 1970, 15,467/70
Int. Cl. B22d 45/00
U.S. Cl. 164—339 5 Claims



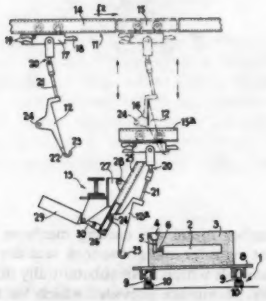
Cavities are lined by means of apparatus which is inserted in the cavity and expanded to apply lining material, placed between apparatus and cavity wall, onto the wall of the cavity.

3,727,677

APPARATUS FOR REMOVING PARTS CAST IN SAND MOULDS

Pierre Robert Thomas, Pont-a-Mousson, France, assignor to Societe Des Fonderies de Pont-A-Mousson, Nancy, France

Filed Nov. 24, 1971, Ser. No. 201,705
Claims priority, application France, Dec. 3, 1970, 7043449
Int. Cl. B22d 29/04
U.S. Cl. 164—344 12 Claims



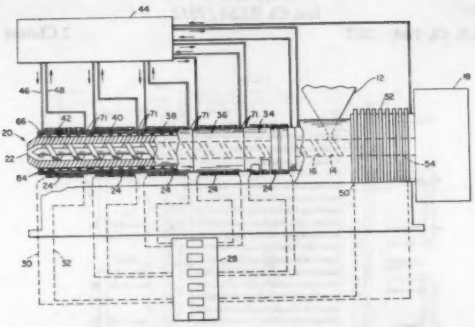
An apparatus for removing castings from foundry moulds each of which is constituted by a mass of sand without a chassis and which travel one behind the other in a moulding line. The apparatus comprises an overhead conveyor having casting-suspending hooks each of which is guided by guide means in the direction of the corresponding mould as the hook descends so as to break up the sand and hook onto an appendix portion, such as a sprue, of the casting and remove the casting from the mould and discharge it.

3,727,678

HEAT TRANSFER DEVICE USEFUL FOR EXTRUDERS

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Dec. 30, 1970, Ser. No. 102,627
Int. Cl. F25b 29/00
U.S. Cl. 165—64 6 Claims



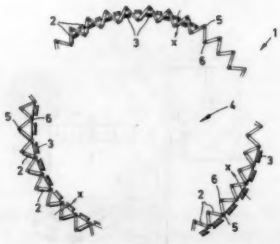
Heat transfer devices useful for extruders. Jacket sections defining inwardly directed ribs are heat shrunk about extruder barrels. By appropriate sizing, the stresses produced exceed the yield stresses causing metal to self-seal any nicks occurring and to expand adjacent base portions tighter against the inner member or barrel. Arelatively hard barrel concentrates the yielding to the metal of the jacket. Heat shrunk ribs provide good heat transfer paths to electric heaters secured about the exterior of the jackets, as well as defining fluid passages. Free flanges joined by narrow root sections enable joining of adjacent jacket sections by welds with immunity to disturbance in the presence of differential expansion of the assembly. Intercommunication of annular compartments is provided by interruption in the ribs or by covered grooves formed through the free side of the jacket wall.

3,727,679

MECHANICAL DRAFT COOLING OR CONDENSING PLANT

Hans-Henning Von Cleve, Bochum, Germany, assignor to Gea Luftkuhlergesellschaft Happel GmbH, Bochum, Germany

Filed July 23, 1971, Ser. No. 165,652
Claims priority, application Germany, Jan. 2, 1971, P 21 00 018.0
Int. Cl. F28f 13/00
U.S. Cl. 165—111 25 Claims



A mechanical draft cooling or condensing plant for air cooling or condensing a medium conducted in a closed circuit, particularly a plant of major cooling capacity, in which mechanical draft cooling air enters the plant substantially in the horizontal direction through vertical walls in the plant and

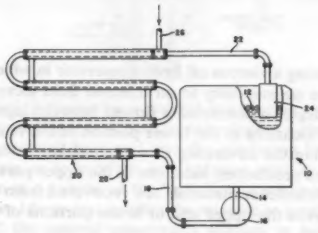
the medium to be cooled flows through plate-shaped cooling elements composed of a plurality of finned tubes, the cooling elements extending in vertical planes and, together with bearing and support means, form one or more of the substantially vertical walls which are zigzag-shaped in plan, and wherein, viewed in the direction of flow of the cooling air in front of and/or behind the walls a large number of extractor and blower fans are disposed in uniform distribution over the entire surface of the wall or walls in immediate proximity with the cooling elements, the fans being placed so that their blades revolve in vertical planes.

3,727,680

APPARATUS FOR FINISHING PATTERNS AND CORE BOXES

Russell Alger Henry, Jr., Albert Lea, Minn., assignor to Deere & Company, Moline, Ill.

Filed Oct. 4, 1971, Ser. No. 186,333
Int. Cl. F28f *19/00*
U.S. Cl. 165—119 **5 Claims**



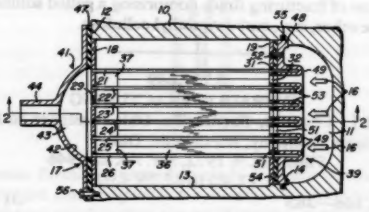
An apparatus for finishing patterns and core boxes which are used under abrasive conditions and in production operations. The invention concerns the formation of an electroless nickel plating on at least the surface portions of the patterns and core boxes which are subject to wear because of repeated contact with molding and core forming materials. The electroless nickel solution is contained in a holding tank comprising a large inert plastic structure supported by surrounding insulating walls. The plastic tank is removable so that a clean tank can be utilized at all times thereby increasing the efficiency and effectiveness of the nickel plating operation. A circulating system including a heat exchanger and filter means is employed to provide maximum efficiency with respect to the use of the plating solution.

3,727,681

CARTRIDGE TYPE TUBE AND FIN HEAT EXCHANGER

Joseph F. Fernandes, Centerville, Ohio, assignor to United Aircarft Productions, Inc., Dayton, Ohio

Filed June 17, 1971, Ser. No. 153,991
Int. Cl. F28b *9/02*
U.S. Cl. 165—158 **14 Claims**



A true counterflow heat exchanger of the tube and fin type having a cartridge design in accordance with which the heat exchanger unit may be removably installed in a housing cavity while retaining its counterflow principle of operation. A manifold member at an inner end of the unit is formed for free flow of a first fluid therethrough and for confined flow of a second fluid to receive such second fluid and return it to the opposite or outer end of the unit.

3,727,682

HEAT EXCHANGERS AND THE METHOD OF MAKING THE SAME

Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Incorporated, Chicago, Ill.

Filed Feb. 24, 1970, Ser. No. 13,297
Int. Cl. F28f *1/14*
U.S. Cl. 165—183 **7 Claims**

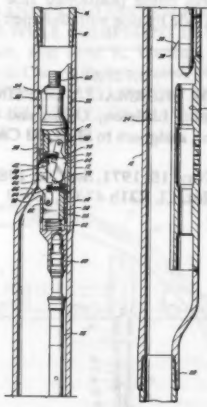
A tubular heat exchanger having spine-type fins formed integrally from the wall thereof and disposed therearound, with the fins cut from ribs extending longitudinally of the heat exchanger, and a method of manufacture which includes rotary movement between a tool and an elongated, ribbed tubular member relative to the longitudinal axis of the latter.

3,727,683

APPARATUS FOR INSTALLING OR REMOVING A FLOW CONTROL DEVICE FROM A WELL TUBING

Ben D. Terral, and William H. Dietz, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Dec. 16, 1971, Ser. No. 208,833
Int. Cl. E21b *7/06*
U.S. Cl. 166—117.5 **9 Claims**



An orienting mandrel having a pocket for receiving a flow control device and a coacting orienting tool for installing and removing a flow control device from the mandrel pocket. The mandrel having a connection at the top and bottom for attachment to a well tubing with the mandrel pocket positioned directly below the top tubing connection and the mandrel including a bore extending between the tubing connections but including a portion offset from the pocket with the tubing con-

nection at the bottom of the mandrel being in alignment with the offset bore portion, and orienting means in the mandrel coacting with the orienting tool. On downward movement through the well tubing the orienting tool coacts with orientation means in the mandrel for moving the flow control device out of alignment with the pocket thereby allowing the tool to pass through the mandrel, but on upward movement the orienting tool moves into alignment with the pocket for allowing flow control devices to be installed or removed from the pocket.

3,727,684

DUPLEX MANDREL FOR A CROSSOVER SYSTEM

Ben D. Terral, and J. Paul Hewitt, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Jan. 31, 1972, Ser. No. 221,990
Int. Cl. F04f 1/20; E21b 17/00
U.S. Cl. 166—242 **5 Claims**

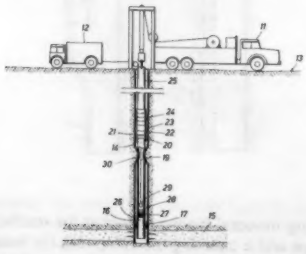
A pair of mandrels providing a crossover system for use in a dual string of well tubing in which each of the mandrels are adapted to be connected in one of the well tubings and each of the mandrels includes an open bore therethrough and a pocket for receiving flow control devices in which the mandrels are connected together with a fluid conduit extending between the pockets. The mandrels are connected together with the open bores being positioned side by side and the pockets positioned side by side with the open bores.

3,727,685

METHOD FOR THERMALLY CUTTING TUBING

Dwayne A. Chestnut, Littleton, Colo., and Clay A. Morris, Sugar Land, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 15, 1971, Ser. No. 198,886
Int. Cl. E21b 47/00, 29/02
U.S. Cl. 166—255 **6 Claims**



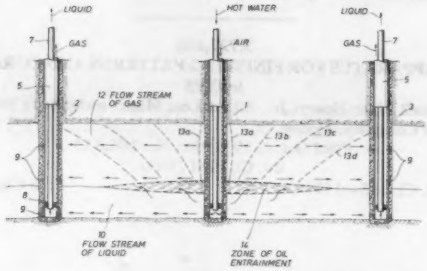
A method for thermally cutting tubing, such as below an internal restriction in a tubing string located in a well bore, which comprises placing in the tubing at the desired location a mixture of finely granulated aluminum with an oxide of iron or other metal and igniting the mixture while applying a tensile load to the tubing string.

3,727,686

OIL RECOVERY BY OVERLYING COMBUSTION AND HOT WATER DRIVES

Michael Prates, Houston, Tex., and Willem F. Engelberts, deceased, late of The Hague, Netherlands (by Catharina H. Engelberts, personal representative), assignors to Shell Oil Company, New York, N.Y.

Filed March 15, 1971, Ser. No. 124,381
Int. Cl. E21b 43/24
U.S. Cl. 166—261 **6 Claims**



In recovering a viscous oil from a reservoir in which the initial effective permeability to an injected fluid increases with increasing depth, a hot liquid is flowed between injection and production locations in the lower portion of the reservoir before or during the advancing of a combustion front between injection and production locations in the upper portion of the reservoir. Petroleum materials are recovered from the fluids produced from the upper and/or lower portions of the reservoir.

3,727,687

AQUEOUS GELS AND USES THEREOF

Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 1, 1971, Ser. No. 159,052
Int. Cl. E21b 43/16
U.S. Cl. 166—274 **25 Claims**

Improvements in secondary recovery operations for the recovery of oil, and improvements in well drilling operations, are accomplished through the use of aqueous mediums comprising new aqueous gels prepared from water and cellulose ethers.

3,727,688

HYDRAULIC FRACTURING METHOD

Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1972, Ser. No. 224,921
Int. Cl. E21b 43/26, 43/27
U.S. Cl. 166—283 **25 Claims**

Improvements in hydraulic fracturing of underground porous formations penetrated by a well bore are accomplished by the use of fracturing fluids comprising a gelled solution of a cellulose ether, e.g., carboxymethyl cellulose.

3,727,689

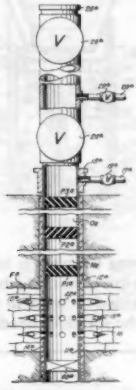
HYDRAULIC FRACTURING

Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 9, 1972, Ser. No. 224,946
Int. Cl. E21b 43/26, 43/27
U.S. Cl. 166—283 **31 Claims**

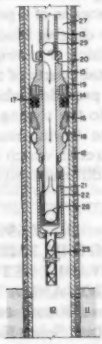
Improvements in hydraulic fracturing of underground porous formations penetrated by a well bore are accomplished by the use of fracturing fluids comprising aqueous gels prepared from water or brines and certain polyacrylamides and related polymers.

3,727,690
METHOD OF FRACTURING A NATURAL GAS BEARING EARTH FORMATION
David M. Munson, 5128 Brookview, Dallas, Tex.
Filed Oct. 18, 1971, Ser. No. 190,099
Int. Cl. E21b *43/26*
U.S. Cl. 166—297 5 Claims



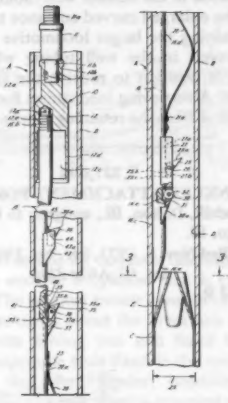
A method of fracturing a natural gas bearing earth formation penetrated by a well bore by introducing a charge of oxygen into the well bore and into the producing formation in such volume as to produce an explosive mixture of natural gas-oxygen in a portion of the formation extending about and from the well bore and igniting the mixture to produce an explosion of the natural gas-oxygen mixture in such portion thereby causing fracturing of the formation. The method may also include the steps of filling the well bore with a liquid of low compressibility prior to the ignition of the natural gas-oxygen mixture present in the formation to limit or prevent damage to the well and to contain and control the explosion.

3,727,691
METHOD AND APPARATUS FOR TREATING SUBTERRANEAN FORMATIONS
Thomas W. Muecke, and Fred A. Brooks, Jr., both of Houston, Tex., assignors to Esso Production Company, Houston, Tex.
Filed Dec. 16, 1970, Ser. No. 98,781
Int. Cl. E21b *33/13*, *43/27*
U.S. Cl. 166—295 15 Claims



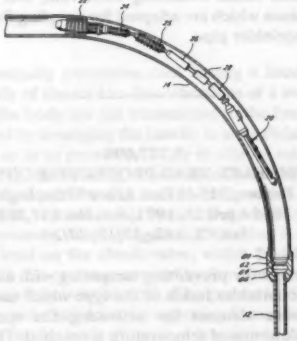
Separate fluids are passed through separate conduits in a wellbore and commingled at a subsurface location to form a single stream which is then passed through a mechanical mixing device. The mechanical mixing device intermixes the two fluids in proportion to their respective volumetric flow rates producing a uniform treating composition which is then forced into contact with the formation to be treated.

3,727,692
LINER REMOVAL APPARATUS
John C. Kinley, and Walter C. Jefferson, both of Houston, Tex., assignors to said Kinley, by said Jefferson
Filed Dec. 20, 1971, Ser. No. 210,020
Int. Cl. E21b *29/00*
U.S. Cl. 166—297 19 Claims



A method and apparatus for removing a metallic liner from the inside wall of production tubing downhole in an oil well which includes a longitudinal spear member eccentrically attached to a mandrel and a housing assembly which is adapted for connection to a wireline or other downhole tool. As the end of the spear member is moved between the liner and the tubing, it deforms the liner to produce a reverse bend therein throughout the length of the liner for reducing the diameter of the liner to thereby release same from the tubing for withdrawal from the tubing.

3,727,693
METHOD AND FLUID SYSTEM FOR MOVING SUBSURFACE WELL EQUIPMENT IN WELL TUBING
Gilbert H. Tausch, and Fred E. Watkins, both of Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.
Filed Dec. 15, 1971, Ser. No. 208,339
Int. Cl. E21b *23/00*, *23/04*, *43/10*
U.S. Cl. 166—315 20 Claims



A fluid system for running and retrieving subsurface well equipment in a well tubing by fluid flow through a curved en-

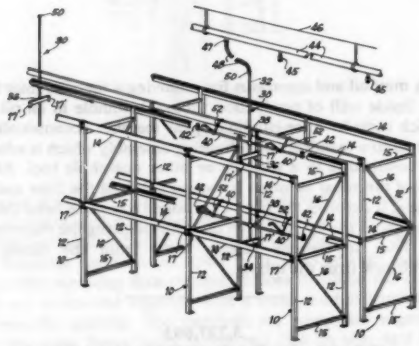
trance tubing without restricting the length of the well equipment. The curved entrance tubing having an inside diameter greater than the inside diameter of the well tubing for transporting a first larger locomotive which carries a second smaller locomotive for movement in the well tubing in response to fluid flow. Releasable engaging means between the larger and smaller locomotive whereby the larger locomotive may transport the smaller locomotive through the enlarged curved entrance tubing but allow the smaller locomotive to move alone in the smaller well tubing. A retaining nipple between the enlarged curved entrance tubing and the well tubing for retaining the larger locomotive while the smaller locomotive travels in the well tubing whereby the larger locomotive is in position to receive the smaller locomotive upon its return. A retrieving mechanism for retrieving the enlarged locomotive from the retaining nipple.

3,727,694

SPRINKLER ATTACHMENT FOR RACKS

Leonard J. Dudzik, Dolton, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Nov. 5, 1971, Ser. No. 196,113
Int. Cl. A62c *3/00*
U.S. Cl. 169—2 R **3 Claims**



A sprinkler attachment is provided for use with knockdown racks of the type having a plurality of slotted upright posts connected by horizontal cross members. The sprinkling apparatus includes a vertical sprinkler pipe fastened to a pair of connecting brace members which bridge and connect to at least two of the upright posts. The sprinkler pipe has a plurality of sprinkler heads extending therefrom, and carries inlet coupling means which are adapted for coupling fluid flow conduit to the sprinkler pipe.

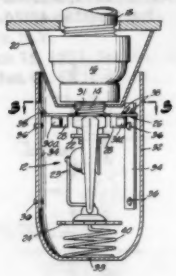
3,727,695

SPRINKLER HEAD PROTECTIVE COVER

Bertram A. Danton, 315-½ East Arbor Vitae, Inglewood, Calif.

Filed April 26, 1971, Ser. No. 137,398
Int. Cl. A62c *37/12, 37/20*
U.S. Cl. 169—37 **8 Claims**

An apparatus for preventing tampering with automatic fire extinguisher sprinkler heads of the type which use a temperature-responsive element for activating the sprinkler head when a predetermined temperature is reached. The apparatus comprises a collar which is attached to the sprinkler head, a cover which cooperates with the collar to completely enclose the temperature-responsive element of the sprinkler head, and a plurality of struts which interconnect the cover and the collar. The struts are attached to the inner walls of the cover by fusible connectors which are adapted to fail at a predetermined temperature, thereby allowing the cover to separate



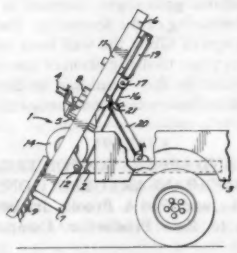
from the collar. A spring member is interposed between the sprinkler head and the cover so that when the fusible connectors fail at a predetermined increase in temperature the cover will be ejected free of the sprinkler head.

3,727,696

VIBRATING PLOW TO BURY CABLE AND THE LIKE

Robert O. Hansen, 4549 W. Rosecrans, Hawthorne, Calif.

Filed Jan. 4, 1971, Ser. No. 103,530
Int. Cl. E02f *5/18*
U.S. Cl. 172—40 **7 Claims**



When a trench is dug for the purpose of burying cable, pipe, or the like, the digging mechanism includes a blade which is vibrated vertically by means of a power mechanism. This vertical movement of the digging blade tends to impart a vibration to the machine which is towing the trench digger, which results in injury to certain parts of that machine. With this invention a structure is provided which materially reduces the transmitted vibration to the towing machine so that injury to the mechanisms of the towing machine is greatly reduced. Also the depth of the trench which is dug by the digging blade can be adjusted to suit different requirements.

3,727,697

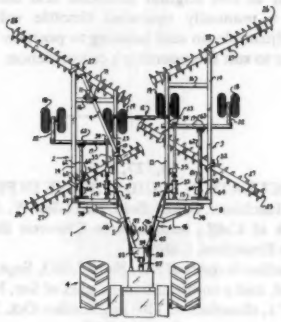
EARTH WORKING IMPLEMENT WITH A PAIR OF MOBILE UNITS MOVABLE BETWEEN A SIDE-BY-SIDE WORKING POSITION AND A TRAILING POSITION

Robert A. Wilbeck, Reno, Kans., assignor to Wibeck Machine and Manufacturing, Inc., South Hutchinson, Kans.

Filed Feb. 22, 1971, Ser. No. 117,344
Int. Cl. A01b *23/04*
U.S. Cl. 172—313 **5 Claims**

An earth working implement having a pair of mobile units movable between a side-by-side working position and a trailing position behind a prime mover is disclosed which includes an adjustable tongue structure on a forward end of each mobile unit for connection together and to the prime mover. A

tow bar has one end thereof pivotally mounted on one of the mobile units and the other end engageable with the tongue structure of the other unit to permit same to be moved to a trailing position behind the one unit upon forward movement



of the prime mover. A suitable member is mounted between the units and connected thereto for maintaining same in side-by-side working position until said units are to be moved to a trailing position for transporting the implement.

3,727,698

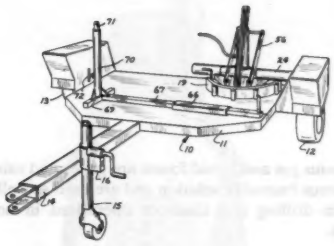
LIFT AND CARRIER TRAILER APPARATUS

Samuel H. Van Selus, Echo, Minn.

Filed Oct. 9, 1970, Ser. No. 79,564

Int. Cl. A01b *59/043*

U.S. Cl. 172—439 **22 Claims**



Trailer apparatus for hauling wide width implements, for example three-point hitch cultivators, having a trailer body, a turntable mounted on the rear left of the body to pivot about a vertical axis, arms adapted to be attached to the lower two hitch points of the implement mounted on the turntable for pivotal movement about a horizontal axis, a piston cylinder combination pivotal mounted on the turntable, linkage mechanism operated by the expansion of said combination for pivoting said arms and second linkage mechanism pivotally mounted on the frame and adapted to be attached to the upper third hitch point to pivot the implement to elevate its rear end portion relative its front end portion as the arms are pivoted to lift the front of the implement. A horizontally and vertically adjustable support member is provided for supporting a part of the weight of the implement when the turntable has been pivoted from its implement pickup to its implement road travel position.

3,727,699

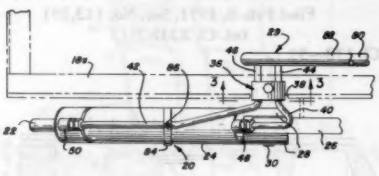
SUPPORT MEANS FOR CYLINDER CONDUITS

Donald C. Baker, Rosedale, and Krikor Yessayan, Brazil, both of Ind., assignors to J. I. Case Company, Racine, Wis.

Filed Aug. 13, 1971, Ser. No. 171,707

Int. Cl. E02f *3/76*

U.S. Cl. 172—809 **9 Claims**



Conduit support means for conduits that supply pressurized fluid to opposite ends of a cylinder that is pivoted about a fixed pivot axis. The support means consists of a member that is supported for rotation about the pivot axis of the cylinder with rigid conduits having one end fixed to the support member and the opposite ends fixed to the respective ends of the cylinder so that the cylinder, conduits and support member are pivoted as a unit about a common pivot axis.

3,727,700

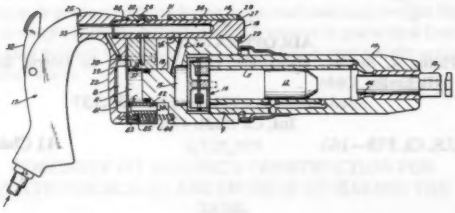
PNEUMATICALLY PERCUSSIVE TOOL HAVING A VIBRATION FREE HANDLE

Lester A. Amtsberg, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed April 19, 1971, Ser. No. 135,121

Int. Cl. B25d *17/04*

U.S. Cl. 173—18 **13 Claims**



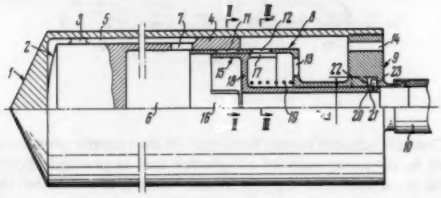
A pneumatically percussive tool having a handle isolated from the body of the tool so that vibrations of a reciprocating hammer in the body are not transmitted to the handle. This is accomplished by arranging the handle in axial slidable relation to the body so as to permit the body to vibrate relative to the handle; and by maintaining a cushion of pressurized air in a chamber between the handle and the body which chamber is connected with a pressure air source and with a relief check valve. The pressure developing in the chamber is determined by a spring load on the check valve, which load varies automatically with the pressure exerted by the operator in holding the tool pressed against the work. The pressurized air cushion constantly counterbalances the opposing force exerted by the operator so that the body of the tool is maintained at all times in spaced relation to the handle as it vibrates. A pair of air feed ports to the hammer are adapted to be brought into or out of register with each other accordingly as the tool is pressed against or removed from the work.

3,727,701

REVERSIBLE AIR-PUNCHING MECHANISM FOR MAKING HOLES IN SOIL BY COMPACTION

Boris Vasilievich Sudnishnikov, Alexandr Dmitrievich Kostylev, Konstantin Stepanovich Gurkov, Konstantin Konstantinovich Tupitsyn, Vladimir Dmitrievich Plavskikh, all of Novosibirsk; Viktor Eliseevich Solomko, and Alexandr Mironovich Reinsburg, both of Odessa, all of U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, USSR, Novosibirsk Krasny Prospekt

Filed Feb. 8, 1971, Ser. No. 113,291
Int. Cl. E21b *3/12*
U.S. Cl. 173—91 **1 Claim**



The invention relates to reversible air-punching mechanisms for making holes in soil by compaction.

According to the invention, the mechanism comprises a hollow housing in which a striker reciprocated by compressed air, strikes the housing and thus moves it through the ground.

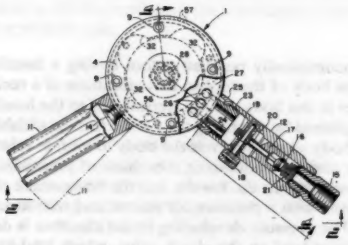
The compressed air is delivered into the working chambers through an air-feed bushing which is provided with two rows of ports getting alternately in line with the corresponding rows of ports in the hollow slide valve accommodated in the bushing as said slide valve turns around its longitudinal axis. For turning the slide valve, it is connected with the bushing by a projection which moves along an enclosed shaped recess during the reciprocating motion of the slide valve when the mechanism is reversed by cutting off momentarily the supply of compressed air to the mechanism.

3,727,702

AIR OPERATED TOOL

Philip A. Snider, Hicksville, Ohio, assignor to Dotco, Inc., Hicksville, Ohio

Filed April 19, 1971, Ser. No. 135,137
Int. Cl. B23b *47/08*
U.S. Cl. 173—163 **11 Claims**



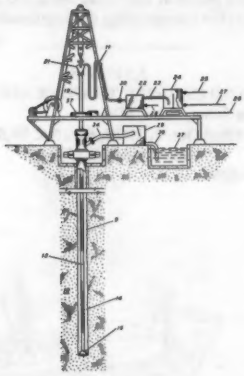
An air operated tool characterized in that it is of lightweight strong construction and in that the air motor and surrounding tool housing define therebetween a large size annular exhaust chamber through which air exhausted from the motor passes at low velocity to lateral exhaust passages in the housing thus to provide a tool which operates at low noise level. The tool herein is further characterized in that it has a simplified starting slot arrangement wherein an angularly disposed passage through one stator end plate communicates an inlet chamber of the motor with the starting slot. The tool herein is still further characterized in that the tool housing has two generally radially extending hollow handles by which it is held and manipulated, one handle being secured to the tool housing in either of two angular positions and the other handle containing a manually operated throttle valve and being rotatably adjustable on said housing to position the valve control member to suit the operator's convenience.

3,727,703

WELL CIRCULATION FLUID FOR USE IN PERMAFROST

Stanley O. Hutchison, Bakersfield, and Glen W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 77,083, Sept. 30, 1970, abandoned, and a continuation-in-part of Ser. No. 130,511, April 1, 1971, abandoned. This application Oct. 22, 1971, Ser. No. 191,655
Int. Cl. E21b *21/04*
U.S. Cl. 175—69 **11 Claims**



Aqueous gas and liquid foams are generated using a gas and an aqueous foamable solution and are used as well circulation fluids in drilling and cleanout operations in holes in permafrost.

3,727,704

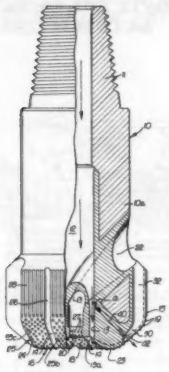
DIAMOND DRILL BIT

Thomas L. Abplanalp, Vernal, Utah, assignor to Christensen Diamond Products Company, Salt Lake City, Utah

Filed March 17, 1971, Ser. No. 125,138
Int. Cl. E21b *9/36*
U.S. Cl. 175—329 **16 Claims**

A rotary bit having diamond cutting elements in its drilling face for drilling a bore hole, drilling fluid being pumped from the bit and into primary feeder waterways in the drilling face extending to the outer gauge portion of the bit. Jet passages receive drilling fluid from the interior of the bit, discharging such fluid into secondary waterways in the drilling face in the direction of rotation of the bit and toward the outer gauge portion, to create low pressure regions in the secondary waterways and cause fluid to flow from the relatively high pressure

feeder waterways across the intervening bit faces toward the secondary waterways, effecting a cleaning action of the



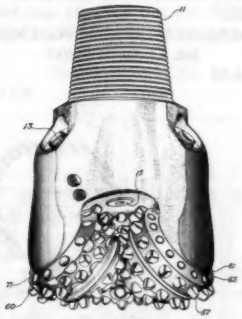
cuttings from the bottom of the hole, the bit faces and the diamonds embedded therein, such cuttings being flushed upwardly around the bit toward the top of the bore hole.

3,727,705

DRILL BIT WITH IMPROVED GAGE COMPACT ARRANGEMENT

Elmer F. Newman, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jan. 21, 1972, Ser. No. 219,669
Int. Cl. E21b *9/08, 9/36;* **E21c** *13/01*
U.S. Cl. 175—374 **4 Claims**



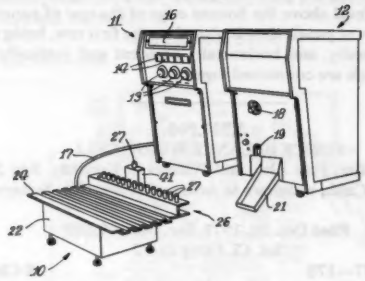
A drill bit is disclosed as having a gage compact arrangement by which the resistance to gage wear is increased, gage wear is balanced and the tendency toward off-center wear decreased. The heel row compacts on each cone generally are equally spaced. However, the spacing between the heel row compacts differs from cone to cone to prevent tracking of the compacts in impressions previously made on the bore hole bottom. The cross-sectional dimension of the gage compacts that project from, and protect, the gage surface of each cone is different from cone to cone. As a consequence, the total exposed area of all the gage compacts of one cone approaches the total exposed area of all the gage compacts of each of the other cones.

3,727,706

TARE SETTING APPARATUS AND METHOD

August L. Streater, and Donald A. Bonness, both of Bluffton, Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed April 21, 1972, Ser. No. 246,162
Int. Cl. G01g *9/00, 13/14*
U.S. Cl. 177—1 **14 Claims**



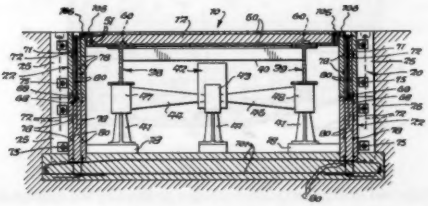
A tare setting arrangement and associated control circuitry for a scale system wherein the pan or platform of the system, on which the articles to be weighed are placed,includes means for supporting a plurality of tare weights. The weights have different values which are equivalent to the tare values expected to be encountered during operation of the scale. Before weighing an article, all of the tare weights are placed by an operator in the support means and the system output is set to indicate zero weight. Thereafter, before weighing an article having a known tare value, a tare weight equivalent to the tare value of the article is removed from the support means by the operator, and the article is then weighed. When operated properly, the system gives an accurate indication of the article weight less tare, or net weight, because the removed tare weight offsets or compensates for the tare of the article. To ensure that the operator places all of the weights in the support means when setting the system to zero, and also removes one of the weights before weighing an article, a holder for the removed tare weight is provided, and control circuitry is connected in the holder to sense the presence of a weight. The system is prevented from being set to indicate zero weight if a tare weight is in the holder, and the system is prevented from making normal weighing operations when a tare weight is not in the holder.

3,727,707

CONCRETE PIT AND DECK CONSTRUCTION FOR PLATFORM SCALES AND METHOD OF MAKING THE SAME

John M. Machala, 54 West Main Street, Corfu, N.Y.

Filed Aug. 9, 1971, Ser. No. 170,036
Int. Cl. G01g *19/02*
U.S. Cl. 177—134 **7 Claims**



A pit and deck construction for platform scales including a plurality of precast concrete panels joined end-to-end

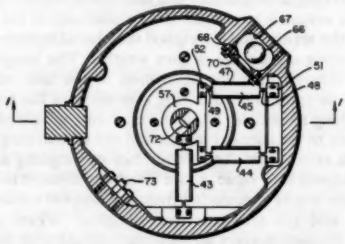
horizontally and secured to a supporting weighbridge to form the deck. The pit walls each comprise a plurality of precast concrete panels joined end-to-end, disposed vertically and supported by the pit floor, and the panels include flanges which when connected to adjacent flanges of adjoining panels form pilasters for supporting the walls. The walls are constructed by supporting a first row of panels a predetermined distance above the pit bottom and then pouring the concrete floor to a level above the bottom edge of the row of panels. A second row of panels then is placed on the first row, being supported thereby, and horizontally adjacent and vertically adjacent panels are connected together.

3,727,708

FORCE BALANCE WEIGH CELL

Alan J. Adler, Palo Alto, and William S. Kennedy, San Jose, both of Calif., assignors to Acurex Corporation, Sunnyvale, Calif.

Filed Dec. 20, 1971, Ser. No. 209,689
Int. Cl. G01g *23/32*
U.S. Cl. 177—178 **8 Claims**



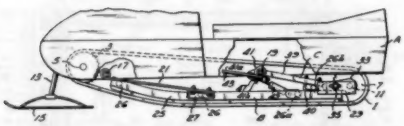
A force balance weigh cell having a movable weight structure supported by a flexure system which allows only vertical movement, a photocell position sensing system provides an electrical output signal which is indicative of displacement of the weight structure, the signal is employed to develop a current which is proportional to displacement and rate of displacement and an electromagnetic means receive the signal and apply a restoring force to the weight support structure. The signal is a measure of the weight or force applied to the structure.

3,727,709

SNOWMOBILE CONSTRUCTION

Neil A. Newman, Mansfield, Ohio, assignor to Rupp Industries, Inc., Mansfield, Ohio

Filed Sept. 27, 1971, Ser. No. 183,777
Int. Cl. B62d *27/02*
U.S. Cl. 180—5 R **4 Claims**



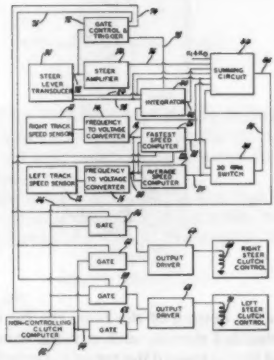
A structure for resiliently supporting the body of a snowmobile including an endless track, slides engaging the track and connected to the frame for limited arcuate movement and spring means controlling such arcuate movement.

3,727,710

STEER CONTROL FOR A TRACK-LAYING VEHICLE

Robert K. Sanders, Whitestown; Jerry R. Marlow, Greenwood, and Kenneth A. Dornfeld, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 13, 1971, Ser. No. 142,880
Int. Cl. B62d *11/08*
U.S. Cl. 180—6.7 **5 Claims**



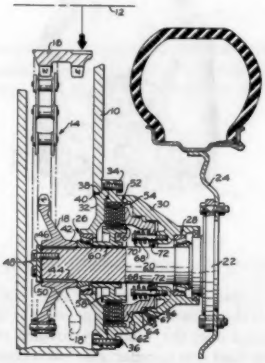
An electronic control circuit combined with an electrohydraulic transducer regulates right and left steering clutches in a cross-drive transmission for a track-laying vehicle to effect steering by driving. The control inputs are steer lever position and track speeds so that a closed loop control is provided for controlling track speed differential as a function of actual relative track speeds.

3,727,711

TANDEM DISC BRAKE ASSEMBLY

James R. Sebern, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed April 23, 1971, Ser. No. 136,887
Int. Cl. B62d *61/00*
U.S. Cl. 180—24.05 **5 Claims**

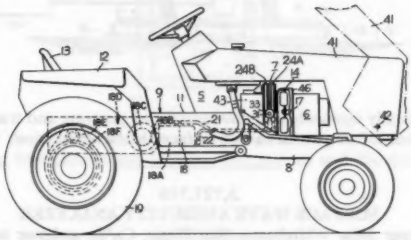


There is disclosed a drive axle support assembly including a housing which independently carries a drive axle and a disc brake assembly such that the housing may be attached or detached from a support frame without disturbing the drive shaft bearing supports or the brake assembly within the housing.

3,727,712
COOLING ARRANGEMENT

Marcus J. Colloton, Cedarburg, Wis., assignor to Simplicity Manufacturing Company, Inc., Port Washington, Wis.

Filed Nov. 11, 1971, Ser. No. 197,693
Int. Cl. B60k *11/06, 19/14*
U.S. Cl. 180—66 R 4 Claims

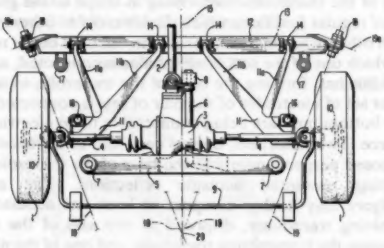


This invention is concerned with a cooling system for a tractor having an air-cooled engine and having a hydraulic fluid transmission. This system includes having a hydraulic fluid radiator through which cooling air is drawn before passing same over the engine for cooling same and wherein such radiator can be pivoted about the longitudinal axis of such tractor to provide ready access to mechanism underlying such radiator and also presenting such radiator to a position where it can be readily cleaned.

3,727,713
INDIVIDUAL WHEEL SUSPENSION AT INCLINED OR LONGITUDINAL GUIDE MEMBERS FOR MOTOR VEHICLES

Friedrich H. Van Winsen, Kirchheim/Tech, and Friedrich Hoffman, Stuttgart-Bad, Cannstatt, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Aug. 15, 1969, Ser. No. 850,559
Claims priority, application Germany, Aug. 16, 1968, P 17 80 209.4
Int. Cl. B60g *11/00*
U.S. Cl. 180—73 R 13 Claims

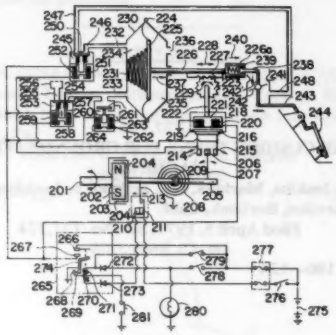


An individual wheel suspension for the rear wheels of ttor vehicle in which the guide members, either inclined or longitudinal guide members, are pivotally connected at a common axle support which is connected wth the vehicle superstructure by way of elastic elements; the lines which extend through the elastic elements-disposed in front of the wheel axes-and which are perpendicular to the deflection directions of these elements, intersect in a point to the rear of the wheel axes that is disposed in a vertical plane containing the center longitudinal axis of the motor vehicle.

3,727,714
AUTOMATIC CONSTANT SPEED DRIVING SYSTEM FOR AUTOMOBILES

Toshio Ishikawa, Kariya, Japan, assignor to Nippondenso Kabrishiki Kaisha, Aichi-ken, Japan

Filed Nov. 3, 1970, Ser. No. 86,400
Claims priority, application Japan, Nov. 25, 1969, 44/94822; Nov. 25, 1969, 44/94823; Dec. 1, 1969, 44/96425; Dec. 1, 1969, 44/96427
Int. Cl. B60k *31/00*
U.S. Cl. 180—108 6 Claims

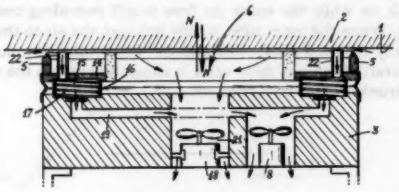


An automatic constant speed driving system for automobiles comprising a speed detecting unit for generating a signal proportional to the car speed, means for actuating an engine throttle, and a speed setting magnetic clutch capable of connecting the speed detecting unit and the engine throttle actuating means with each other at any given car speed, whereby when the magnetic clutch is in the coupled position, the speed detecting unit is caused to store as a set speed the displacement of the throttle actuating means proportional to the car speed and this set speed is compared with the detected speed so that the throttle actuating means is operated so as to effect the constant speed driving of the vehicle.

3,727,715
SYSTEM FOR ESTABLISHING A PNEUMATIC CONNECTION BETWEEN AN OBJECT AND A WALL

Maurice Barthalon, Allee des Sapins le Petit Vaupereux La Faret, Verrieres le Buisson, France

Filed March 25, 1971, Ser. No. 127,962
Claims priority, application France, April 1, 1970, 7011567; Sept. 22, 1970, 7034254
Int. Cl. B60v *1/04*
U.S. Cl. 180—118 32 Claims



A system for providing a pneumatic connection between an object and a wall which are capable of relative displacement, which comprises a guiding chamber which confines a gas layer at a pressure which is different from the ambient pressure, said chamber being delimited by skirts which are carried by the object and directed towards said wall. At least a part of the skirts

is capable of moving with respect to the skirt-carrying object and is positionally controlled relative to this latter. At least one movable skirt is connected mechanically to the movable partition of a variable-pressure pneumatic balancing chamber which is mounted on the object and separate and distinct from the guiding chamber. Pneumatic control means are further provided for adjusting the position of said partition as a function of the distance from the lip of the movable skirt to the wall. Under these conditions, the lips of the skirts can be maintained at a practically constant distance from said wall. The object can be a vehicle and the wall a track provided for said vehicle.

3,727,716

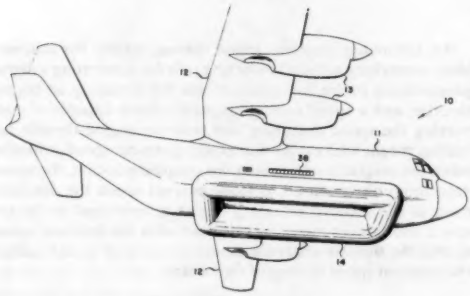
AIR CUSHION TRUNK FOR GROUND EFFECT MACHINES

Dave H. Jenkins, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed April 5, 1971, Ser. No. 131,274

Int. Cl. B60v *3/08*

U.S. Cl. 180—124 **10 Claims**



An air cushion trunk sealing system for ground effect machines is provided to prevent air leakage from the trunk during periods of operation and parking when the primary power of the machine or craft is turned off. This system is composed of an inner tube type liner (which may be, and preferably is, constructed of multiple cells) which is collapsed, doubled and attached to the underside of the craft and within the trunk. Before the trunk air is turned off, air of higher pressure than trunk pressure is routed into the collapsed inner tube to inflate it. As this inner tube inflates, it replaces the trunk air while the trunk air flow is still providing craft support. When the inner tube is fully inflated, the air to the trunk is fully diverted overboard and the inner tube now supports the craft. The inner tube valve is closed to contain the air and the trunk air may be turned off.

3,727,717

AIR COUPLED SEISMIC ENERGY GENERATOR

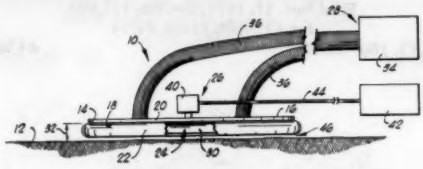
Dale E. Miller, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Aug. 24, 1971, Ser. No. 174,343

Int. Cl. G01v *1/02*

U.S. Cl. 181—0.5 VM **12 Claims**

An improved seicmic energy generator wherein pressurized air is supplied between a base plate and the earth's surface to form an air cushion therebetween, and the base plate is driven



vertically upwardly and downwardly to generate and transmit a seismic force to the earth's surface via the air cushion.

3,727,718

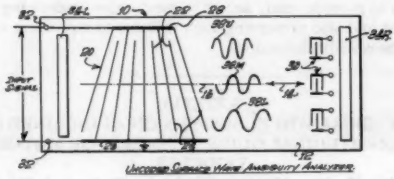
SURFACE WAVE AMBIGUITY ANALYZER

Harper John Whitehouse, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 24, 1971, Ser. No. 201,693

Int. Cl. H03h *7/30;* **G01r** *23/00*

U.S. Cl. 181—.5 AP **9 Claims**



A surface-wave ambiguity analyzer comprising a substrate, capable of propagating an acoustic surface wave on its surface, and a transmitting electroacoustic transducer, disposed upon the substrate, having a perimeter substantially in the shape of a trapezoid whose base is parallel to the direction of surface wave propagation. The transmitting transducer comprises a pair of sets of interdigited electrodes, the configuration of the electrodes conforming in shape to the graphs of a set of regular functions which do not cross or otherwise touch each other, a top bus bar, parallel to the base of the trapezoid, to which one of the sets of electrodes is connected, and a bottom bus bar, forming the base of the trapezoid, to which the other set of electrodes of the pair of sets is connected, the top and bottom bus bars being connectable to an electrical signal source. Two absorbers, one on each end of the substrate, are disposed perpendicularly to the base of the trapezoid, for absorbing unwanted acoustic reflections. The ambiguity analyzer may further comprise at least one acousto-electric receiving transducer, disposed at one end of the substrate between the transmitting transducer and one of the absorbers, whose electrodes are disposed perpendicularly to the direction of propagation of the acoustic wave.

3,727,719

SOUND REPRODUCING SYSTEM

Stephen Yando, Huntington, N.Y.

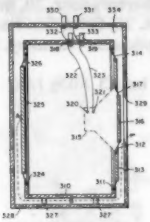
Filed June 19, 1969, Ser. No. 840,117

Int. Cl. G10k *13/00;* **H04r** *1/28*

U.S. Cl. 181—31 B **10 Claims**

A dynamical system for the reproduction of sound. The system includes a relatively small enclosure with a driven loudspeaker cone and one or more free pistons suspended in

airtight fashion in openings in the enclosure. A rigid shell having an opening juxtapositioned to the driven cone, may surround the enclosure, for purposes of increasing the coupling among free pistons and between free pistons and the driven cone.



3,727,720

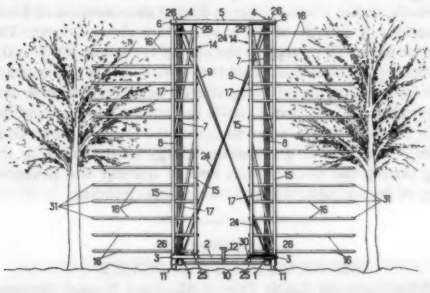
MOVABLE APPARATUS FOR USE IN PICKING FRUIT

Francois Duc, La Sabatiere, Bergerac, France

Filed April 12, 1972, Ser. No. 243,294

Int. Cl. E06c 5/02

U.S. Cl. 182—38 **5 Claims**



Ladders for use in picking fruit are mounted to slide laterally on a supporting vehicle. The steps of each ladder project laterally beyond one of its uprights.

3,727,721

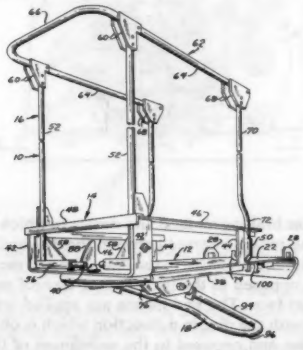
COLLAPSIBLE WINDOW SCAFFOLD

Walter Kulesa, 2445 West Moffat, Chicago, Ill.

Filed March 3, 1972, Ser. No. 231,635

Int. Cl. A47l 3/02

U.S. Cl. 182—62 **3 Claims**



A scaffold which is positionable in a window opening to extend outward therefrom for supporting a workman and equipment exteriorally of a window mounted in the opening. The scaffold includes a platform having a flat surface, with a hook portion on one end of the platform and a pair of cross-bar holding ears adjacent to the hook. A cross-bar is removably mounted in the ears for engagement with the interior of a building wall. A safety rail is mounted on the platform adjacent to the end, extendable exteriorally of the window. A support brace is hingedly connected to the bottom of the platform and is engageable with the exterior of a building wall to support the platform. The support brace and the safety rail are interlocked when in an extended attitude, and both may be folded against the platform.

3,727,722

TOOL SHELF AND APRON FOR AERIAL CAGE

Melvin Ronald Hedges, Littlestown, and Cyril J. Rickrode, New Oxford, both of Pa., assignors to Cam Industries, Inc., Hanover, Pa.

Filed Dec. 6, 1971, Ser. No. 204,956

Int. Cl. E04g 5/00

U.S. Cl. 182—129 **3 Claims**

A combination shelf and apron of U-shaped configuration molded from reinforced synthetic resin and having horizontal shelf areas with apron walls extending upwardly from the outer edges of said shelf areas to provide increased safety for a workman in an aerial platform or cage and also provide shelf areas to support tools. The shelf and apron unit is readily attachable to the upper rail of existing aerial platforms and cages and has attaching means to engage the same.

3,727,723

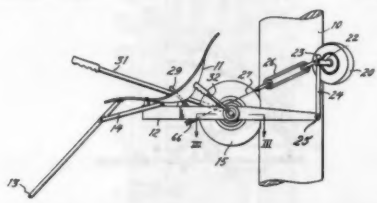
HEIGHT-ADJUSTABLE TREE SEAT

Laren Pitcairn, R.D. 1, Pipersville, and Haig Kurkjian, Malvern, both of Pa., assignors to said Pitcairn, by said Kurkjian

Filed Feb. 16, 1971, Ser. No. 115,492

Int. Cl. A63b 27/00

U.S. Cl. 182—133 **10 Claims**



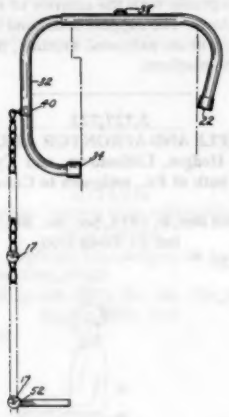
Apparatus for ascending and descending a tree, pole, or similar cylindrical vertical member is provided with a seat and with manually operable mechanism so that a person seated thereon can raise and lower himself along the vertical member. Height is determined by controlling rotation of a positioning wheel having a resilient peripheral surface in frictional engagement with the vertical member.

3,727,724

FIRE ESCAPE LADDER

Joseph Gilbert, 210 Pond Crossing, Nassau, N.Y., and Simon Shafer, 196-12 Keno Avenue, Queens, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,115
Int. Cl. E06c 1/56
U.S. Cl. 182—198 2 Claims



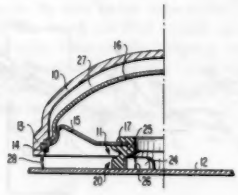
An improved fire escape ladder of a type adapted to be engaged with a window sill by straddling a lower edge thereof. The straddling means includes provision for adjustment in relation to the thickness of the wall mounting the window sill. The stiles of the ladder consist of conventional wire chain links, and the rungs are of hollow metallic tubing. Means is provided for connecting the rungs to the stiles whereby assembly may be accomplished with a minimum of hand labor using components which are of relatively low cost of manufacture.

3,727,725

ARRANGEMENT OF THE SUCTION FUNNEL OF THE LUBRICATING OIL PUMP IN THE OIL SUMP OF AN INTERNAL COMBUSTION ENGINE

Wolfram Dahm, Raidwangen, Nurtingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed May 20, 1971, Ser. No. 145,439
Claims priority, application Germany, May 21, 1970, P 20 24 814.0
Int. Cl. F01m 1/12
U.S. Cl. 184—6.24 15 Claims



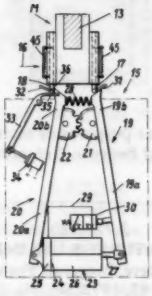
An arrangement for the suction funnel of the lubricating oil pump within the oil pan of an internal combustion engine, in which the suction funnel is supported at the bottom of the oil pan by means of an elastic hollow spacer element whereby the suction opening of the suction funnel terminates in the interior space of the hollow spacer element while the spacer element is provided at its lower end with one or several level-determining openings for an air-free aspiration of the oil.

3,727,726

METHOD OF AND DEVICE FOR OPERATING APPLIANCES HAVING DRIVEN MASSES

Karl-Heinz Nauen, Silberbergerstr. 20, Bremen, Germany

Filed Sept. 25, 1970, Ser. No. 75,512
Claims priority, application Germany, Sept. 26, 1969, P 19 48 683.3
Int. Cl. F03g 1/00
U.S. Cl. 185—39 8 Claims



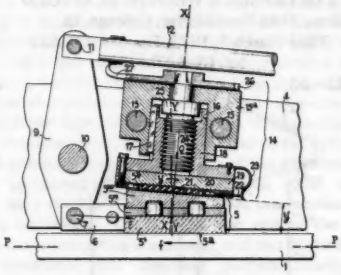
A device for the cyclic acceleration and deceleration or braking of a mass over a short period of time. A mechanical or pneumatic spring is used to store during deceleration or braking the kinetic energy of the mass as it is slowed down. The stored or potential energy in the spring is then applied to the mass during acceleration. Two two-armed levers are coupled to the springs for transmitting energy between the mass and the spring. Locks or swivel pawls are used to couple and decouple the mass to the levers such that the levers are moved in a manner to transfer the kinetic energy of the mass to the spring during the deceleration and to transfer the potential energy of the spring to the mass during acceleration.

3,727,727

BRAKE METHOD AND DEVICE

Jean-Marc Laurent Hauth, Pont-A-Mousson, France, assignor to Pont-A-Mousson S.A., Pont-A-Mousson, France

Filed July 31, 1970, Ser. No. 59,918
Claims priority, application France, Aug. 11, 1969, 6927515
Int. Cl. F16d 55/08, 55/16
U.S. Cl. 188—72.9 1 Claim

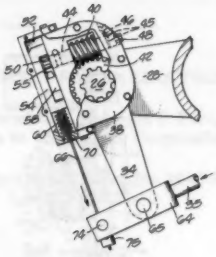


Friction disc braking method and device in which the disc is braked by pad means inserted between the disc and a support face slightly oblique relative to the disc. The pad means have a bearing face opposed to the friction face thereof and parallel to the support face. The pad means are applied into braking engagement with the disc in a direction which is oblique relative to the disc and opposed to the movement of the disc by bearing against a fixed body in such manner that the reaction is exerted in a direction slightly oblique relative to the normal to the disc and toward the disc.

3,727,728
AUTOMATIC BRAKE SLACK ADJUSTOR

James L. Bostwick, 1501 Bluff Drive, Santa Barbara, Calif.

Filed Feb. 16, 1972, Ser. No. 226,695
Int. Cl. F16d 65/56
U.S. Cl. 188—79.5 K 8 Claims

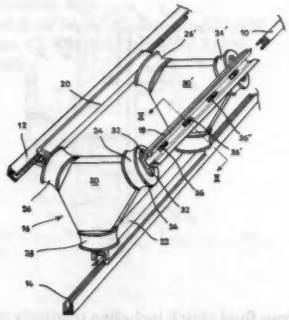


An operating rod is pivotally connected to a brake operating arm that rotates a conventional brakes-applying cam and the end of the operating rod extends beyond the pivotal connection to the brake operating arm. Slack adjustor mechanism in a housing on the brake operating arm includes a reciprocative member in a side compartment of the housing which member operates a pawl and ratchet means to take up slack in the brake. The side compartment is on the side of the housing that is away from the axle housing of the vehicle. The reciprocative member is connected to the extended end of the operating rod by a flexible tension member and is biased away from the extended end of the operating rod. Lost motion between the reciprocative member and the extended end of the operating rod determines the magnitude of the movement of the reciprocative member and thus determines the magnitude of the increments of slack adjustment.

3,727,729
MULTI-PHASE ELECTRICAL DISTRIBUTION AND CURRENT COLLECTING SYSTEM FOR HIGH SPEED VEHICLES

Jean-Pol Payen, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Oct. 6, 1970, Ser. No. 78,547
Int. Cl. B60l 5/08
U.S. Cl. 191—45 R 9 Claims

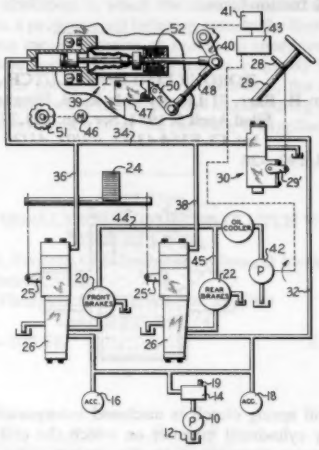


A collector head movable along a passageway defined by a plurality of parallel multi-phase energizable feed conductors comprises for each conductor a set of longitudinally spaced apart contact shoes supported by a longitudinal carrying structure for resilient engagement with the corresponding conductor. Resilient support means, such as pneumatic cushions, for the carrying structures improve guide response of the collector head.

3,727,730
VEHICLE POWER AND BRAKE COOLING CONTROL

Donald L. Bianchetta, Coal City; Richard E. Guhl; Samuel L. Kershaw, both of Decatur, and John F. Szentes, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 16,864, March 5, 1970, abandoned.
This application Jan. 31, 1972, Ser. No. 222,407
Int. Cl. B60k 29/02; F16d 65/84
U.S. Cl. 192—3 R 8 Claims

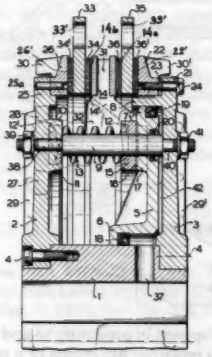


A vehicle retarding system in which the heat of a retarding brake is absorbed by cooling medium supplied from a motive means driven by the vehicle engine, including means operable when the brake is used to effect retarding, to increase the speed of the engine and consequently the volume of the cooling medium directed to the brake, and also including means to disconnect the vehicle drive so that the increased engine speed is not transmitted to the vehicle wheels.

3,727,731
FLUID OPERATED CLUTCH AND SPRING OPERATED BRAKE

Hans Selig, Remscheid, Germany, assignor to Firma Gebruder Ortlinghaus Ohg., Wermelskirchen, Germany

Filed Jan. 31, 1971, Ser. No. 222,140
Claims priority, application Germany, Feb. 10, 1971, P 21 06 260.2
Int. Cl. F16d 67/04
U.S. Cl. 192—18 A 10 Claims



In a combined clutch and brake apparatus, a pressure means is shifted by a piston and a spring between two positions

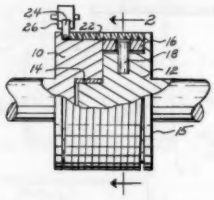
for frictionally coupling a casing, whose hub portion is connected with a shaft, either with a rotary friction means or with a blocked friction means. Bolts connect the casing end wall's, and pass through the cylinder chamber, a piston in the cylinder chamber, and the pressure means which is biassed to abut the piston, and is shifted by pressure fluid in the cylinder chamber in one direction, and by a spring in the opposite direction. Due to the position of the bolts, the apparatus is compact, has a small outer diameter, and comparatively wide annular friction faces.

3,727,732

TORQUE LIMITING CLUTCH

William H. Barr, 51 Liberty Pole Road, Hingham, Mass.

Filed April 5, 1971, Ser. No. 131,223
Int. Cl. F16d *43/21, 49/02, 41/20*
U.S. Cl. 192—26 10 Claims



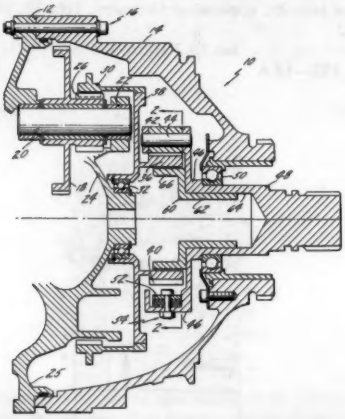
A coil spring clutch is disclosed incorporating a resilient radially cylindrical member on which the coil spring bears. The torque transmitted by the spring urges the yieldable member to contract so that the clutch will slip at a constant predetermined value of the torque. The yieldable member contracts as a result of the major tensile stresses in the helical spring, making the slip torque substantially independent of large variations in the coefficient of friction of the clutch elements. Also disclosed are means for adjusting the clutch for varying the slip torque.

3,727,733

STARTER-PAWL RATCHET CLUTCH SNUBBER

James A. Mrazek, South Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 8, 1972, Ser. No. 251,488
Int. Cl. F16d *41/12*; F02n *15/02*
U.S. Cl. 192—42 7 Claims



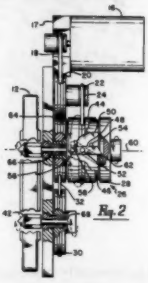
A snubber disposed in proximity to and in cooperation with the ratchet of a pawl/ratchet clutch of a pneumatically driven starter serves to prevent breakage of the component parts of the starter in the event that less than the total number of pawls engage the ratchet when in the driving condition.

3,727,734

BIDIRECTIONAL LEVER ARM CLUTCH

Kent W. Hanson, c/o Univac Park, P.O. Box 3525, American Fork, Utah

Filed March 29, 1972, Ser. No. 239,084
Int. Cl. F16d *41/12*; G03b *1/12*
U.S. Cl. 192—48.92 6 Claims



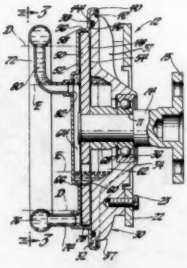
A bidirectionally rotatable mechanism for separately driving two unidirectionally rotatably driven devices is disclosed. The mechanism includes a bidirectionally driving external rim that encompasses a bidirectionally driven internal device that supports two oppositely axially aligned lever arms. The external rim is pin coupled to slots in the ends of the lever arms such that rotation of the external rim in the clockwise or counterclockwise direction rotates one or the other of the lever arms into axial alignment and also rotates the internal device in the like clockwise or counterclockwise direction. The one axially aligned lever arm then engages an associated unidirectionally rotatably driven member.

3,727,735

VISCOUS FLUID CLUTCH

Frank E. La Flame, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 10, 1971, Ser. No. 151,872
Int. Cl. F16d *35/00*
U.S. Cl. 192—58 B 9 Claims



A viscous fluid clutch including relatively rotatable first and second drive members having fluid shear spaces therebetween which are cooperable with a predetermined volume of a fluid medium in the shear spaces to provide a resultant variable speed differential between the first and second members, and a separately located circular tubular reservoir member with at least one conduit communicating between the tubular reservoir chamber thereof and the outer peripheral portions of the fluid shear spaces. Expansion and contraction of the fluid medium, resulting from changes in ambient temperature

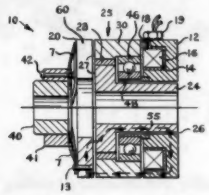
around the circular tubular reservoir member, cause the annular level of the fluid medium in the shear spaces to vary, thus varying the speed of an associated cooling fan. To supplement the expansion and contraction characteristics of the usual silicone fluid, other fluids or materials, such as a refrigerant, a wax, or polypropylene, may be contained in the tubular reservoir chamber.

3,727,736

ARMATURE ASSEMBLY FOR AN ELECTROMAGNETIC CLUTCH

Donald L. Miller, Horseheads, and John F. Puro, Elmira, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sept. 29, 1971, Ser. No. 184,750
Int. Cl. F16d *27/10*
U.S. Cl. 192—84 C **4 Claims**



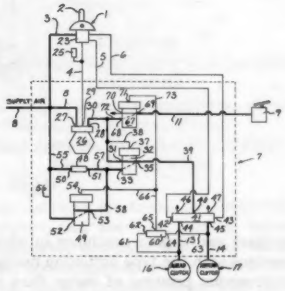
An apparatus to substantially eliminate audible noise in electromagnetic shaft coupling devices having input and output torque transmitting members is disclosed which utilizes an armature assembly comprising an annular armature member having a slot extending fully through a radial segment thereof, and a flexible coupling rotatably mounted to the armature such that the armature is suspended thereby, which assembly permits the armature to twist and flex independently of both torque transmitting members thereby lowering the resonant frequency during torque transmission. The improved armature assembly conforms to magnet body pole face irregularities, eliminates backlash, and reduces the run-in time required to reach design torque.

3,727,737

PRESSURE MODULATING SYSTEM FOR REVERSING CLUTCHES AND THROTTLE CONTROL

John M. Phinney, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed June 14, 1971, Ser. No. 152,938
Int. Cl. F16d *25/10*; B60k *21/00*
U.S. Cl. 192—.098 **5 Claims**



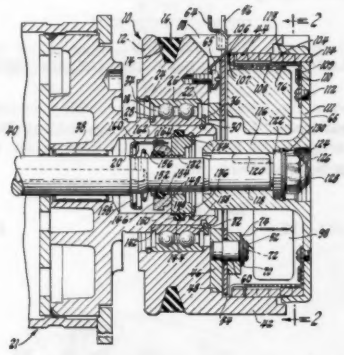
A pneumatic clutch control assembly for a ship's propulsion system which sequentially controls the inflation and exhaust of pneumatically operated clutches and also controls the throttle system of an associated prime mover. Upon actuation of a control valve, which may be located in the pilot house and at other locations, a series of valves are sequentially operated to inflate a selected ahead or astern clutch in one of two conditions: (1) a first condition in which the clutch is inflated to reduced pressures according to the variable pressure of the control valve to allow slippage of the clutch and permit operation at speeds below the idle speed of the prime mover, and (2) a second condition in which the clutch is inflated to full pressure under a programmed inflation rate. In the first condition, the prime mover remains at minimum speed and only part of the idle torque is transmitted as required for the desired propeller speed. In the second condition, the control assembly limits the prime mover control signal during periods of partial clutch inflation until full pressure is supplied to the clutch.

3,727,738

CENTRIFUGALLY ENGAGED COIL CLUTCH WITH WEIGHT LOCK

John R. Briar, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 9, 1972, Ser. No. 224,769
Int. Cl. F16d *43/14*
U.S. Cl. 192—105 CE **6 Claims**



The centrifugally actuated spring clutch illustrated includes two pairs of alternately positioned centrifugal weight members, one pair of which, under the action of centrifugal force, frictionally engages an energizing cup attached to a coil-wound torque spring for effecting the driving of an output shaft. The second pair of weight members abuts respective adjacent actuating weight members to supplement the force thereof and to thus serve as torque-multipliers therefor, enabling heavy torque loads to be driven by a relatively compact clutch assembly. A lock plate may be manually moved to lock both pairs of weights in an inoperative position.

3,727,739

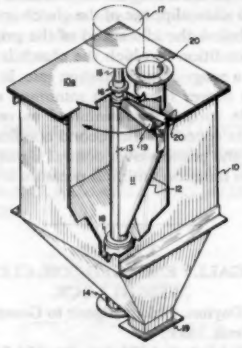
ROTARY ARCUAL SAMPLE FOR PARTICULATE MATERIALS

Fred R. Huntington, Salt Lake City, Utah, assignor to The Gallgher Company, Salt Lake City, Utah

Filed Feb. 7, 1972, Ser. No. 224,171
Int. Cl. B65g *11/20*
U.S. Cl. 193—31 **10 Claims**

A rotary arcual sampler for sampling streams of particulate material having a housing with upper and lower openings vertically aligned intermediate of the housing wall and vertical central axis, an internal sample chute rotatable about the cen-

tral axis having an upper opening and a lower opening through the vertical central axis, a pair of cutter lips disposed near op-



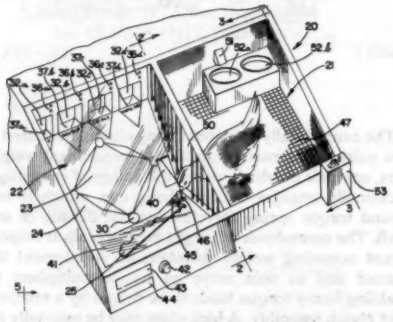
posite sides of the upper chute opening, said cutter lips extending radially from the vertical central axis and having a surface inclined slightly from the vertical.

3,727,740

COIN-OPERATED TRAINED ANIMAL AMUSEMENT APPARATUS

Grant Evans, Hot Springs National Park; Billy Joe Petty, Malvern, and Robert E. Bailey, Hot Springs National Park, all of Ark., assignors to Animal Behavior Enterprises, Inc., Hot Springs National Park, Ark.

Filed July 8, 1971, Ser. No. 160,862
Int. Cl. A01k *15/00*
U.S. Cl. 194—12 **16 Claims**



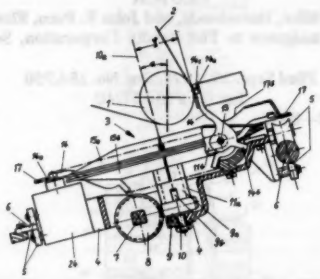
A trained animal amusement apparatus in which a trained chicken or other animal in a containing compartment engages a person in a game of skill which takes place in a playing compartment. Electric circuitry is provided to enable a trained animal and a person to participate in a sequential game. Provision is expressly made to prevent both players from operating at the same time. A solenoid controlled impeller is provided to direct a ball towards a target. Alternative switching provides for separate turns for the trained animal and person. Scoring may be registered when the ball goes through a target in one embodiment. The trained animal is rewarded for successful completion of its specified routine of performance or game task.

3,727,741

PRINTING MECHANISM HAVING A RIM OF ROTATING TYPELEVERS

Folker Galaske, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 22, 1968, Ser. No. 754,578
Claims priority, application Germany, Sept. 19, 1967, P 15 37 440.0
Int. Cl. B41j *23/38*
U.S. Cl. 197—18 **11 Claims**



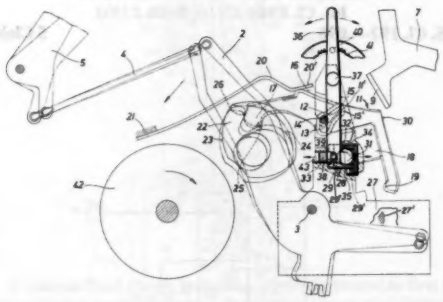
a type bar assembly continuously rotating below a platen, with the printing point lying on or in the direct proximity of the extended center line of the axis of the assembly, it is provided that the printing plane is arranged in front of the center line of the axis when viewed in the printing direction, and that the distance therebetween is determined by the maximum admissible relative speed between the firmly arranged platen and the type bar movement, at the moment of printing.

3,727,742

ADJUSTABLE BLOCKING MEANS FOR TYPING AND PRINTING MECHANISMS

Albert Rix, Wilhelmshaven; Georg Werner, Heidmuhle, and Hans Fuchs, Wilhelmshaven, all of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed June 12, 1970, Ser. No. 45,771
Claims priority, application Germany, June 14, 1969, P 19 30 362.9
Int. Cl. B41j *5/22*
U.S. Cl. 197—107 **6 Claims**

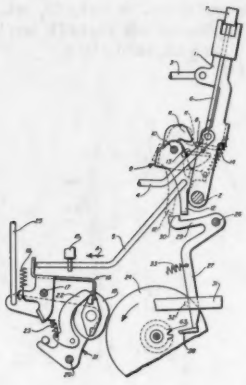


For typewriters and similar machines in which a blocking means cooperates with the type actuating means for preventing the simultaneous printing of more than one type, the blocking means is a member such as a ball block mounted on a lever for pivoting movement to vary the position of the blocking member relative to the type actuating means during the normal operation of the machine. A ratchet is provided to fix the blocking member in the desired position.

3,727,743
CARBON RIBBON TRANSPORTING AND INSTALLATION FACILITIES

Hans-Georg Hengelhaupt, 8500 Nuernberg, and Friedrich Teichmann, 8501 Feucht, both of Germany, assignors to Triumph Werke Nuernberg A.G., Nuernberg, Germany

Filed Feb. 3, 1971, Ser. No. 112,334
Claims priority, application Germany, March 7, 1970, P 20 10 862.7
Int. Cl. B41j *35/10*
U.S. Cl. 197—159 **10 Claims**



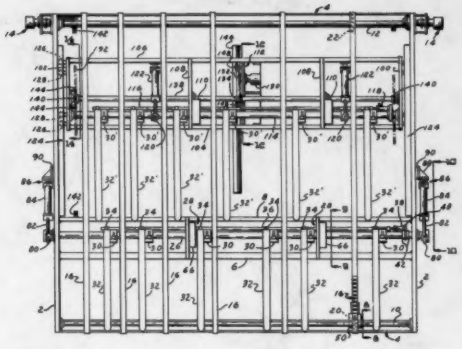
In a typewriter, a pair of transport rollers are effective incidental to typing operations to advance a carbon ribbon threaded through a vibrator to pay it off over a redirecting guide roll to be wound to a spool which is under constant impositive winding urge. A ribbon control member, when operated, separates the transport rollers and also lifts the vibrator to an accessible position. Incidental thereto, a correlation of the guide roller relative to the transport feed rollers and the vibrator is established which facilitates the presentation of carbon ribbon in a straight line condition extending from said vibrator between the transport rollers and behind the guide roller. A drive control member, when operated, causes power-step-movements of the transport rollers, but an interlocking means permits operation of only one of said control member at a time. The machine includes a member to set a fabric ribbon vibrator for elevation to desired extents and when set renders the drive control member inoperable. Conversely, if the drive control member is operated, the ribbon control member is incapable of being set.

3,727,744
APPARATUS FOR OVERTURNING STACKED SHEET MATERIAL

Edwin J. Willard, East Longmeadow, Mass., assignor to Longview Fibre Company, Longview, Wash.

Filed April 16, 1971, Ser. No. 134,635
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AD **5 Claims**

Load turning conveyor apparatus, for overturning stacks of paperboard sheets and the like, having laterally spaced horizontally supported conveyor belts, load turning supports in upstream and downstream spaced relation and means to adjust the spacing thereof commensurate with the height of a stack, each support having two sets of load engaging legs pivotally movable upwardly through the belts to a vertical position above the belts and downwardly to a horizontal position below the belts, said legs being releasably engageable in right angled load engaging relation on each support, means for separately pivoting each support through an arc of 90° for rotating the upstream support and lifting a stack of sheets on

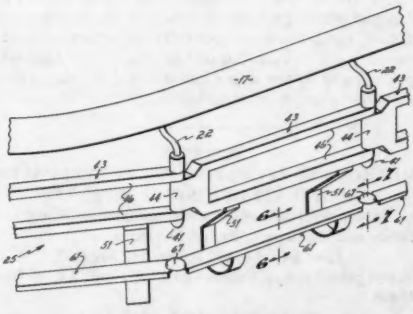


edge and in position for the downstream support to rotate and lower said stack in overturned condition on the conveyor.

3,727,745
CONVEYOR RAIL

Frank H. Richterkessing, Louisville, Ky., assignor to W. M. Cissell Manufacturing Company, Louisville, Ky.

Filed Feb. 28, 1972, Ser. No. 229,997
Int. Cl. B65g *1/12*; A47f *3/08*
U.S. Cl. 198—181 **7 Claims**

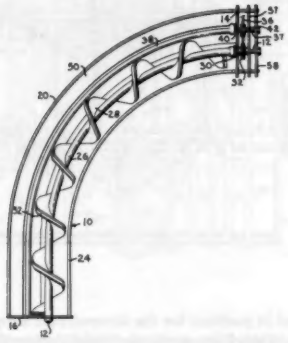


A garment conveyor rack having an endless garment hanger receiving conveyor which is power driven to move around curves or corners to form a closed path, the conveyor having an uninterrupted rail to allow free sliding movement of the garment hangers in either direction. The rail is constructed of straight metal sections which are pivotally linked together at structural joints formed by a slippery pivot pin having a curved raised head which operates as a camming surface to lift a sliding hanger a slight distance out of contact with the metal rail sections before the hanger reaches the end of the rail section so that the hanger will pass over the joints smoothly to permit continuous movement of the hangers along the rail. The joints are symmetrically shaped so that hangers can be moved with equal freedom in either direction along the rail. One of the surfaces of either the rail sections or the links is preferably split on both sides of the other of the surfaces to aid in a smooth transfer of a sliding hanger from one of the surfaces to the other.

3,727,746
FLEXIBLE AUGER

Emmet Garr Slusher, Lexington, Mo., assignor to Bank of Higginsville, Higginsville, Mo.

Filed Oct. 22, 1970, Ser. No. 82,895
Int. Cl. B65g 33/00
U.S. Cl. 198—213 8 Claims

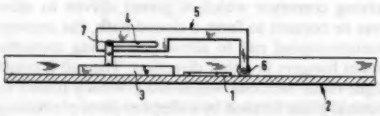


An auger for a conveyor comprising an elongated shaft capable of extending along a curvilinear axis, a flexible, rotatable tube telescoped over the shaft and an elongated helical vane of flexible material extending outwardly from the tube. In a typical embodiment, the auger is used with a housing closed along one side with an upright wall and a wall extending downwardly at an angle into relatively close proximity to the auger. The bottom and the other side of the housing comprise spaced apart, elongated rods which support the assembly and permit gravitation of trash from the conveyor. An elongated, rotatable hose above the auger serves to deflect conveyed items toward the closed side of the conveyor for proper transfer by the auger and a shield maintains the conveyed items in proper location with respect to the auger.

3,727,747
METHOD AND APPARATUS FOR CONVEYING THE SUBSTRATE OF CIRCUIT SUPPORTS

Hans Damm, Iffezheim, Germany, assignor to Schmall Automation und Elektronik, Baden, Germany

Filed Dec. 14, 1971, Ser. No. 207,925
Claims priority, application Germany, Dec. 14, 1970, P 20 61 466.8
Int. Cl. B65g 25/08; B65h 5/04
U.S. Cl. 198—221 5 Claims

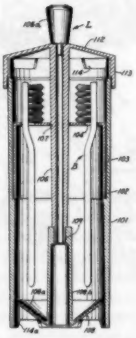


A method and an apparatus of conveying the substrate of circuit supports, especially in shallow slide grooves or tracks open at the upper side thereof, by means of a slide, said slide first moving the substrate beneath a pressure roller movably positioned above said groove, thereafter jointly moving said substrate and said pressure roll resting on said substrate to the desired locaton within said slide groove, and, upon returning into the original position, moving said pressure roller away from said substrate and into its original position. Said apparatus comprising at least one shallow slide groove or track open at its upper side and serving to receive said substrate, a slide for advancing said substrate and movably positioned within said grooves, and a pressure roller for loading said sliding substrate and being mounted for movement together with said slide.

3,727,748
TOOTHBRUSH HOLDER

Robert D. Brown, 5255 N. Cangus Drive, Agoura, Calif.

Continuation-in-part of Ser. No. 865,658, Oct. 13, 1969, abandoned. This application Jan. 29, 1971, Ser. No. 111,009
Int. Cl. A45d 44/18
U.S. Cl. 206—15.1 C 4 Claims

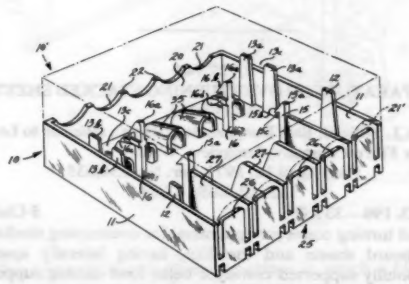


A toothbrush holder in which a number of brushes are hung in an enclosure from a brush support, a lifter for the brushes having a stem slidably extending through the brush support, and having a lower lift plate engageable with the brush handles to lift the brushes, the stem also having a closure for the enclosure which is lifted from the top of the enclosure before the brushes are elevated.

3,727,749
TAMPER-PROOF CONTAINER

Harold B. Martin, Roselle, N.J., assignor to Graber-Rogg, Inc., Cranford, N.J.

Filed July 1, 1971, Ser. No. 158,776
Int. Cl. A45c 11/26; B65d 17/16, 43/14
U.S. Cl. 206—17.5 10 Claims



A tamper-proof container, such as the modular compartmental type for holding pencil-type articles such as hypodermic syringes, pencils, pens, etc. The container is formed of first and second similarly molded units having guide

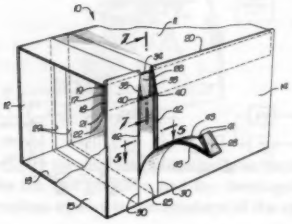
means and fastening means thereon for permanently orienting and locking the units together. A tab must be fractured for removal of any one article from the container, the remaining succeeding articles in the container being precluded from removal due to the construction of projecting members therein.

3,727,750

STERILE PACKAGE AND BLANK THEREFOR

Noel A. Petter, Glendale, Calif., assignor to Standard Paper Box Corp., Los Angeles, Calif.

Filed Dec. 20, 1971, Ser. No. 210,051
Int. Cl. A61b *19/02*; A61l *15/00*; B65d *5/54*
U.S. Cl. 206—63.2 R 15 Claims



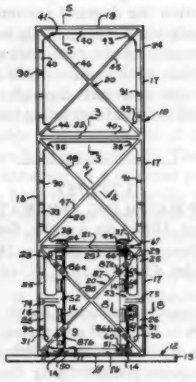
A sterile package formed from a blank made of a delaminatable material, preferably paperboard, has a tear strip defined therein by scoring the blank to define a plane of cleavage along which the tear strip delaminates. An inwardly folded tab is formed on one end of the tear strip for bonding to the package to form a bacteria tight seal at the end of the tear strip. The tab is pulled to open the package by delaminating the tear strip along its plane of cleavage.

3,727,751

REEL AND DISPLAY STAND THEREFOR

Elliott G. Bloch, and Eric M. Bloch, both of P.O. Box 1681, Wichita, Kans.

Continuation-in-part of Ser. No. 756,898, Sept. 3, 1968,. This application Sept. 5, 1969, Ser. No. 855,711
Int. Cl. B65d *85/67*; B65h *55/06*, *75/02*
U.S. Cl. 206—50 24 Claims



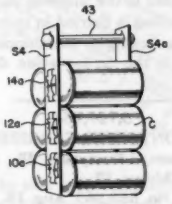
This invention comprises a novel rigid lightweight reel adapted to have material, such as fabric cloth or the like, rolled thereon and means for displaying the reel of material on sale. The reel comprises a lightweight rigid rectangular frame means of a configuration especially suitable for die cast injection molding of plastic.

3,727,752

MULTIPACK CARRIER

Ougljesa Jules Poupitch, Itasca, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 767,387, Oct. 14, 1968, Pat. No. 3,628,823. This application July 7, 1970, Ser. No. 61,002
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 CT 2 Claims



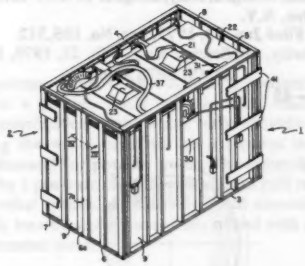
A multi-unit package of containers, such as cans, with outward end beads or rims and a carrier for the package in the form of a strip of suitable material, preferably plastic, carrying clips, either integral with the strip or separately attached thereto, and appropriately spaced to engage adjacent and abutting container rims in the package; and when the strip is assembled to one end of the package, the strip may be looped intermediate adjacent clips to provide finger gripping means for carrying the package or separate handle means may be provided; or when the strip is applied to opposite ends of the packaged containers, the strip may have included handle means for carrying the package with the containers in horizontal position.

3,727,753

BUILDING SUBSYSTEM AND PACKAGING ARRANGEMENT

Richard A. Starr, Allison Park, and Myron Swetlitz, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1971, Ser. No. 192,520
Int. Cl. B65d *9/00*, *85/62*, *71/00*
U.S. Cl. 206—65 R 10 Claims



An essentially self-contained building subsystem, such as a kitchen, is factory constructed in one example of currently preferred form of the unitary assembly including a planar side wall upon which the appurtenances such as kitchen cabinets and appliances are cantilever mounted, the unitary assembly including opposite end walls of greater depth than the appurtenances. Facing wall means of an area essentially coextensive with the planar side wall is secured to abut the edges of the end walls to form a shipping package enclosed on the four vertically extending sides and preferably devoid of a floor, the securing means being of a character permitting relatively

ready lateral separation of the unitary assembly from the facing wall means for properly placing the parts of the unit in the building in which the parts are to be installed. Electrical wiring connections and other functional connections, to the extent they are to extend between the opposite parts of the unit, are provided with sufficient slack length to accommodate the full lateral separation of the parts. In one common type of installation in which the opposite structural frames are essentially U-shaped and mirror images of each other, and the ceiling for the core unit is included in the shipping package, the movable central part of the ceiling is carried in overlapping relation to the fixed sides of the ceiling in the shipping package, and is dropped into place in the center when the core unit is expanded.

3,727,754

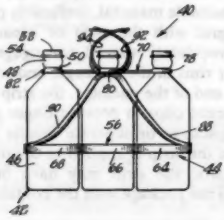
CONTAINER CARRIER

Ernest R. Cunningham, Libertyville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 850,869, Aug. 18, 1969, abandoned. This application June 16, 1971, Ser. No. 153,843

Int. Cl. B65d *71/00*

U.S. Cl. 206—65 E **5 Claims**



A carrier for a six pack of bottles stamped from a flat sheet or tubing of plastic so as to provide a first body section having socket means for receiving and gripping bodies of the bottles, a second body section having additional pockets or elements for engaging and retaining neck portions of the bottles, a plurality of strap elements integrally interconnecting the body sections, and integral handle menas.

3,727,755

PNEUMATIC SEPARATOR FOR A STREAM OF CUT TOBACCO

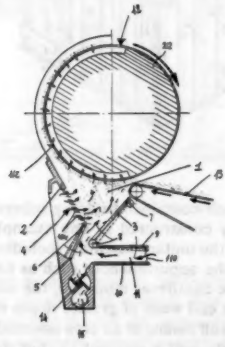
Athos Cristiani, Bologna, Italy, assignor to AMF-Incorporated, White Plains, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,312

Claims priority, application Italy, Feb. 23, 1970, 12491/70

Int. Cl. B07b *13/00*

U.S. Cl. 209—45 **9 Claims**



A stream of cut tobacco having undesired stems and heavy foreign matter is directed to move almost tangentially passed and beneath a drum having an air permeable surface. A source of suction is coupled to suck air through the air permeable surface and into the drum. The movement of air through the surface of the drum causes relatively light particles of tobacco from the stream to move upward and collect on the surface of the drum, the relatively heavy stem and foreign matter falling down into a collecting bin.

3,727,756

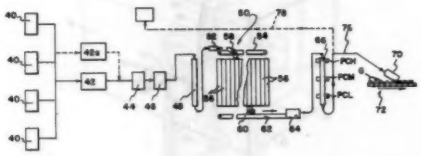
ARTICLE SUPPLY SYSTEM

Joseph S. Koluch, Toledo, and Ralph E. Wittman, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 27, 1971, Ser. No. 147,441

Int. Cl. B07c *5/38*

U.S. Cl. 209—73 **34 Claims**



An article supply system for supplying articles on demand to a production line at which the demand for the articles may be variable or irregular. The system is specifically designed for the production line assembly of composite articles in which two components of the article are continuously manufactured at independently variable rates and fed through separate lines which merge with each other at an assembly station. The system includes a bank of individual storage cells operable to receive, store and discharge in an oriented position like units constituting one component of the composite article. A supply accumulator cell is located upstream of the storage cells to continuously receive the units as they are manufactured and to intermittently transfer the units to selected ones of the storage cells. A demand accumulator is located between the storage cells and the assembly station to continuously supply units to the assembly station in accordance with the demand rate at which the second components of the article are fed to the assembly station. The demand accumulator is supplied with units from the storage cells to maintain an adequate supply of bases within the demand accumulator at all times. Selection of the individual storage cells to be loaded or unloaded is under the control of a computer which maintains an inventory of the status of the various cells at all times. An inspection system also operates through the computer to prevent substandard articles from being transferred to the assembly station.

3,727,757

DIP HANDLING APPARATUS

Claude M. Boissicat, 1010 Lois Avenue, Sunnydale, Calif.

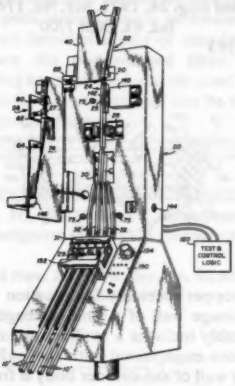
Filed June 12, 1972, Ser. No. 261,671

Int. Cl. B07c *1/02, 5/344*

U.S. Cl. 209—73 **19 Claims**

DIP handling apparatus including a pair of input magazines for containing DIPs to be tested and sorted; a track for serially receiving the DIPs at one end, transporting them in astraddle fashion and subsequently discharging them at the opposite end, an input magazine selecting mechanism for enabling a particular one of the input magazines to be unloaded onto the track; a test mechanism disposed along the track for engaging the electrical conductors of a DIP located along the track at a test position; an indexing mechanism disposed along the track for sequentially locating the DIPs at the test position; a plurality of output magazines for receiving the DIPs after they are tested; a sorting mechanism disposed between the opposite

end of the track and the output magazines for selectively transporting the tested DIP to a particular output magazine;



and logic circuitry for applying test signals to the DIPs as they are located in the test position, and for developing signals to control the various operative mechanisms of the apparatus.

3,727,758

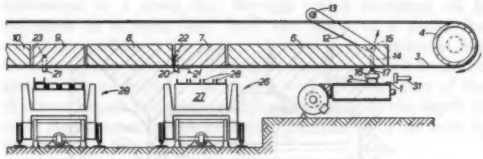
MAGNETIC SORTING AND PILING BANK

William Pettigrew Cleland, Motherwell, Scotland, assignor to British Steel Corporation, London, England

Filed Oct. 13, 1971, Ser. No. 188,742

Int. Cl. B07c *3/02*

U.S. Cl. 209—74 **17 Claims**



A device for sorting and stacking lengths of ferromagnetic material, such as rolled steel sections, includes a horizontal conveyor running below magnets. A handling mechanism which can be electromagnets or movable arms or a second conveyor running over a further magnet lifts the steel sections from a mill roller table to the underside of the horizontal conveyor where they are held magnetically. The sections are then carried under the conveyor to a selected position at which a stop is activated to hold the section while the conveyor continues to move. The magnet at that point is then deactivated and the section falls to a receiving surface which may be a partly formed stack of sections. Provision is made for inverting some sections before placing them under the horizontal conveyor where the stack requires the inclusion of inverted sections. The whole operation may be computer controlled.

3,727,759

GRAIN CLEANER FOR AUGER-EQUIPPED ELEVATORS

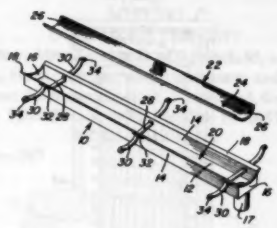
Roy Stevens, P.O. 1, Glenburn, N. Dak.

Filed Jan. 29, 1971, Ser. No. 111,023

Int. Cl. B07b *1/06*

U.S. Cl. 209—283 **2 Claims**

A ready-to-use attachment for a conventional-type small grain elevator. The tubular auger-equipped housing has an elongated slot cut in its bottom where desired. The attachment comprises an elongate box-like trough commensurate in size with the size and shape of the slot. The receptacle portion of this trough is capable of trapping weed seeds and extraneous matter. One end of the trough is provided with a depending



discharge spout. The side walls have outwardly flaring trough positioning flanges. An insertable and removable screen of suitable mesh is fitted and seated in the trough and hinged attaching straps embrace the housing and are detachably bolted in place.

3,727,760

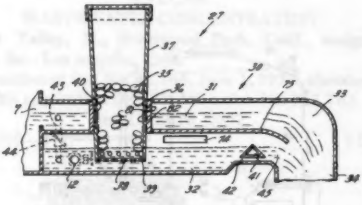
WATER DECOMPOSITION APPARATUS

Charles A. Soriano, Fairfield, Conn., and William E. Hanford, North Tarrytown, N.Y., assignors to World Water Resources, Inc., New York, N.Y.

Filed Feb. 12, 1971, Ser. No. 114,805

Int. Cl. B01d *35/02*

U.S. Cl. 210—101 **9 Claims**



An apparatus is provided between a contaminated water source and a potable water supply which renders effective chemical purification of the water while providing a means of controlling the water input to the apparatus in accordance with the demand for potable water. The controlling means is operated by a pressure chamber which is in turn regulated by a pressure relief means. A relatively small amount of water is chemically treated and subsequently mixed with a large quantity of untreated water.

3,727,761

FLUID FILTER

Ronald A. Aspinwall, Detroit, and MacKellar K. Graham, Birmingham, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

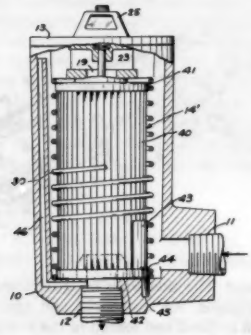
Continuation-in-part of Ser. No. 855,693, Sept. 5, 1969, Pat. No. 3,598,237. This application Feb. 12, 1971, Ser. No. 114,825The portion of the term of this patent subsequent to Aug. 10, 1988, has been disclaimed.

Int. Cl. B01d *27/10*

U.S. Cl. 210—130 **13 Claims**

A filter including a cylindrical filter element which is arranged to normally have fluid pass therethrough. A bypass

valve is provided to bypass fluid directly to the outlet when the pressure at the inlet becomes excessive. A magnetized helical



coil is provided adjacent the filter element to attract metal particles.

3,727,762

FILTER PRESS FOR CONTINUOUS FILTRATION UNDER PRESSURE

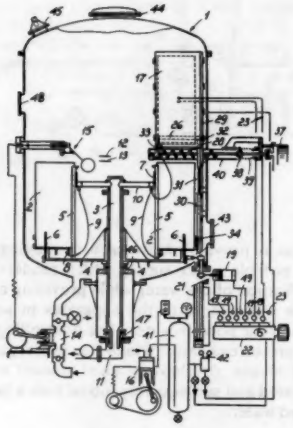
Giuseppe Padovan, Via Fenzi 39, Conegliano, Italy

Filed Aug. 30, 1971, Ser. No. 176,072

Claims priority, application Italy, Sept. 10, 1970, 41617 A/70

Int. Cl. B01d *35/12, 29/38, 29/02*

U.S. Cl. 210—136 **10 Claims**



A filter press operating under pressure including a vessel (1) filled with crude material with compressed fluid lying above. A hollow shaft projects into the vessel and supports an assembly of filter elements immersed in the crude material. At least one drying and removing unit for the filter cake is mounted in the vessel above the crude material, into which the filter elements are brought in succession. Driving means are provided for imparting a stepwise movement to the filter elements to the filter assembly and a raising and lowering movement to the individual filter elements with respect to the drying and removing unit.

3,727,763

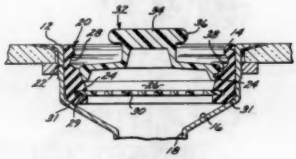
STRAINER-STOPPER ASSEMBLY

Peter T. Arenskov, 2311 Huntington, Anaheim, Calif.

Filed Aug. 24, 1971, Ser. No. 174,459

Int. Cl. E03f *1/00*

U.S. Cl. 210—163 **1 Claim**



A strainer-stopper assembly for location within the usual cylindrical drainage well of a sink, garbage disposer or the like. The assembly includes a resilient annular strainer body adapted for close engagement with the wall of the drainage well. The inner wall of the strainer body is frusto-conical, and a stopper having a frusto-conical outer wall is complementally engaged upon the inner wall of the strainer body. Downward urging of the stopper radially outwardly expands the strainer body into tight, sealing engagement with the adjacent wall of the drainage well.

3,727,764

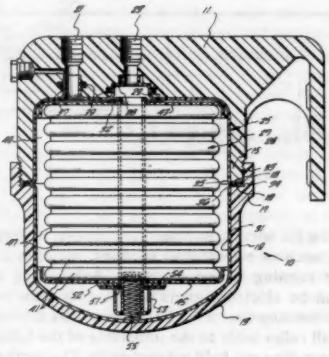
FILTERING APPARATUS HAVING AN INTEGRALLY REMOVABLE FILTER CARTRIDGE

Hubert S. Ogden, 1850 N. Whitley, Hollywood, Calif.

Filed Nov. 22, 1971, Ser. No. 200,850

Int. Cl. B01d *27/08*

U.S. Cl. 210—232 **13 Claims**



A filtering apparatus is described in which a filter assembly is encapsulated in a flexible, pliable, light weight shell and is removable as a unit from the filter housing without manually contacting filter media and/or liquid. The filter housing comprises a manifold and a cylindrical casing joined together to form a cavity for receiving the cartridge. The manifold further includes inlet and outlet conduits extending therethrough. The filter cartridge comprises a pair of cylindrical shells interconnected at their open ends, with the interior of the shells forming a cavity for receiving a filter assembly. The end plane of one of the cylindrical shells includes a pair of tubular extensions extending into the inlet and outlet conduits of the manifold. The two cartridge shells are made of plastic or other suitable material and are sufficiently flexible to bear against the side walls of the housing cavity during operation. In one embodiment, the mating ends of the cartridge shells are coupled by a telescoping connection and bonded. In another em-

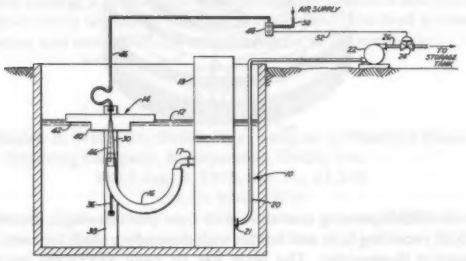
bodiment, the ends of the cartridge shells form mating annular flanges which are bonded together and further secured between two shoulders formed by the interconnecting housing members. The filter assembly preferably comprises a plurality of annular filter pads surrounding a perforated open ended sleeve and stacked between a pair of annular compression plates. To replace the encapsulated filter cartridge, the manifold and casing are separated and the used filter cartridge is removed as a unit. A new cartridge can be installed within the housing in a similar manner.

3,727,765

SKIMMING DEVICE FOR USE ON A LIQUID SURFACE

John L. Henning, Jr., and Warren J. Robicheaux, both of Port Arthur, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1970, Ser. No. 92,639
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **2 Claims**



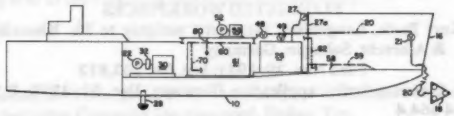
A float-supported skimmer for removal of oil from the surface of a body of water. A float-supported skimmer trough is connected to a drain line through which skimmed oil is delivered to a sump and from the sump to a pump for discharging oil from the system. A valve in the discharge line from the pump controls the rate of discharge of oil from the system. An air bubbler line opens into the lower part of the skimmer trough and sends a signal responsive to the depth of oil in the skimmer trough to control the opening of the valve in the discharge line.

3,727,766

VACUUM SKIMMING APPARATUS FOR REMOVING LIQUID CONTAMINANTS FLOATING IN CONFINED BODIES OF WATER

Don M. Horne, 5300 Swarthmore St., La Mesa, Calif.; William H. Heyser, 1408 Sunnyland Avenue, El Cajon, Calif., and Herman M. Neely, 934 W. Michelle St., West Covina, Calif.

Filed May 18, 1971, Ser. No. 144,500
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **1 Claim**



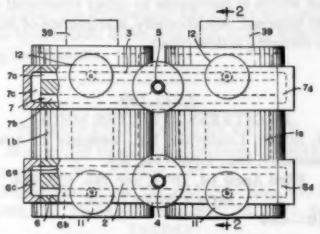
A boat-mounted vacuum system for removing floating liquid contaminants, such as oil spills, particularly from confined bodies of waters such as harbors, bays, and the like. The system employs one or more water jet eductors for creating a vacuum in a vacuum tank located between the suction heads and the pump supplying high pressure water to the eductors so that the pump does not lose its prime when the suction heads are lifted off the water surface from which it is collecting the contaminants.

3,727,767

DOUBLE FILTER UNIT

Friedhelm Itter; Max Feth, both of Remscheid, and Gerd Zimmerbeutel, Huckeswagen, all of Germany, assignors to Barmag Barmer Aktiengesellschaft, Wuppertal, Germany

Filed Oct. 7, 1971, Ser. No. 187,457
Int. Cl. B01d *35/12*
U.S. Cl. 210—247 **15 Claims**



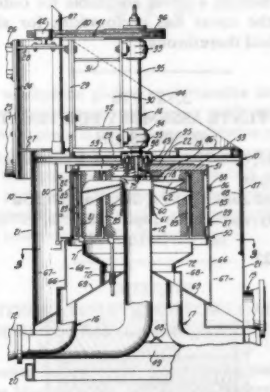
Double filter unit embodying two parallel filter pots with replaceable filters, two bars intersecting and connecting the filter pots, a loop passage in each bar, an inlet pipe on one bar, an outlet pipe on the other bar, and valved ports in each bar connecting the loop passages with the inlet and outlet passages of respective filter pots for selective closing off during filter change or cleaning.

3,727,768

WASTEWATER CONCENTRATION

Walter J. Talley, Jr., Brentwood Park, Calif., assignor to Sweco, Inc., Los Angeles, Calif.

Continuation of Ser. No. 42,165, June 1, 1970, abandoned.
This application Dec. 23, 1971, Ser. No. 211,763
Int. Cl. B01d *33/02*
U.S. Cl. 210—377 **2 Claims**



There are disclosed herein equipment and methods for screening and concentrating waste water overflow from combined sewer systems. Exemplary equipment includes a separator employing a substantially cylindrical rotating screen. Influent is piped upwardly into the equipment and deflected outwardly toward the inner surface of the screen in a manner to achieve a desired flow rate and flow pattern of the influent onto the screen. Means are provided for controlling the flow

rate and for suitably directing the influent in a plurality of substantially discrete inclined streams toward the inner surface of the rotating screen. The screen is rotated at a speed to achieve a desired centrifugal force. Effluent passes through the screen to an outlet and the remaining concentrate passes to an outlet. A certain amount of the influent splashes from the inner surface to the screen, and is received by a backsplash pan and may be recirculated and rescreened. The screen is in the form of a screen cage having a plurality of removable screen panels for facilitating replacement of damaged screens or changing of screen type or mesh size. Cleaning means is provided for directing a cleaning fluid periodically at the screen. The methods disclosed involve the manner in which the influent, effluent, concentrate and backsplash are handled, and the manner in which the influent is screened to achieve a fluid concentrate which is pumpable to other treatment equipment for ultimate disposal. Additionally, a sequence of influent food and screen cleaning is described.

3,727,769

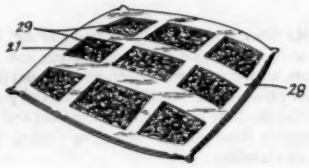
PRESTRESSED FILTER MEDIA

Howard O. Scholl, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed April 14, 1971, Ser. No. 133,914

Int. Cl. B01d *25/04*

U.S. Cl. 210—484 **12 Claims**



An improved fluid treating filter having a support frame disposed between at least two layers of filter media. The support frame is of unitary construction and bowed in a direction opposing the flow of a fluid. One layer of media is in communicative relation with the surface of the frame facing the flow of the fluid whereas the second layer is in communicative relation with the edges of the downstream surface of the frame and is in spaced relationship with the downstream surface. The filter may include a cover adaptable for outerfitting the filter wherein the cover has perforations for allowing the passage of the fluid therethrough.

3,727,770

SEPARATING PLATE ASSEMBLY FOR TREATMENT OF SUSPENSION

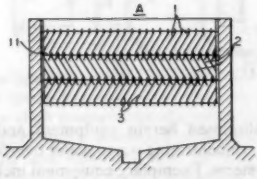
Tadao Mochizuki, 648-735, Hatsutomi, Kamagaya City, Chiba Prefecture, Japan

Filed June 7, 1971, Ser. No. 150,530

Claims priority, application Japan, July 31, 1970, 45/67097

Int. Cl. B01d *21/24*

U.S. Cl. 210—522 **11 Claims**



A multi-stage separating plate assembly comprises a plurality of vertical rows of inclined separating plates arranged in a zig-zag series of plates, said rows being laterally spaced to form a liquid guide path between adjacent rows. A given separating plate at any stage in one of said rows has the lower end thereof extending across the major part of the guide path which it partially defines and close to the upper surface of the next lower separating plate in the adjacent row inclined in the opposite direction.

3,727,771

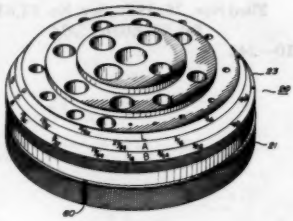
DRILL DISPENSING CONTAINER

John T. Hoffman, 1604 E. Greenleaf St., Allentown, Pa.

Filed Aug. 20, 1971, Ser. No. 173,418

Int. Cl. B25b *3/04*; B65d *83/00*; A47f *1/00*

U.S. Cl. 211—69 **4 Claims**



A drill dispensing container with base plate having a central shaft receiving hole and holder with depending shaft for rotary motion therewithin. The plate has an axial alignment mark and three spring-loaded ball bearings radially disposed to the mark. The plate has axial cylindrical ball receiving pockets with partially covering lips for limiting bearing travel, and has a concentric recess forming an external rim of sufficient depth that extended bearings do not pass the plane thereof. The holder has through drill-receiving apertures axially disposed therewithin about three concentric circles which are staggered so that no two apertures are aligned along a common holder radius. The holder includes indicia for values of drills carried therewithin, each being radially co-aligned with its corresponding aperture. Indexing means positively co-align the indicia to the mark. Axial shaft motion with respect to the plate is restricted via a circumferential shaft groove restrained by a spring-biased bearing directed thereagainst, the bearing being housed within a radial aperture engaging with the hole. A set screw directs the bearing against the groove, permitting rotation, and restricting axial shaft motion with respect to the plate. The container is indexed via a separate spring loaded bearing disposed on the rim engaging within one of several indentations on the holder surface which faces the plate. The indentations are circularly located having its center at the holder axis, and are at least equal to the total through apertures.

3,727,772

APPARATUS FOR CENTERING AND CLAMPING ELONGATED WORKPIECES

Kurt Pauls, Langenfeld, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Nov. 29, 1971, Ser. No. 202,812

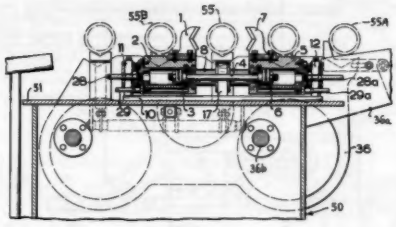
Claims priority, application Germany, Dec. 31, 1970, P 20 64 664.4

Int. Cl. B23q *3/08*

U.S. Cl. 214—1 P **10 Claims**

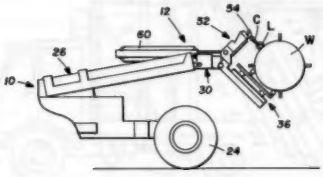
Apparatus for centering and clamping tubes, rods or like workpieces has two double-acting cylinders which are reciprocable along parallel feed screws rotatably mounted in the frame of the apparatus. The feed screws have oppositely inclined mirror symmetrical threads meshing with internal threads provided on nuts which are adjustably fastened to the

cylinders. The cylinders support mirror symmetrical work-engaging claws and receive pistons which are connected to each other by a piston rod extending midway between and being



parallel with the feed screws. When the chambers of the cylinders receive a pressurized fluid so that the cylinders and their claws move toward or away from each other, the feed screws rotate and insure that the cylinders move at the same rate.

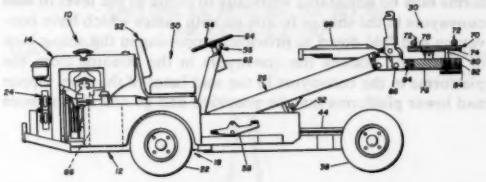
3,727,773
LIFT TABLE
Maston B. Wolfe, Jr., Dallas, Tex., assignor to Standard Manufacturing Company, Incorporated, Dallas, Tex.
Filed Aug. 5, 1970, Ser. No. 61,230
Int. Cl. B66c *23/56*
U.S. Cl. 214—1 D **15 Claims**



A lift table includes a receiving and supporting assembly and at least one lifting arm that extends perpendicularly to the receiving and supporting assembly. The assembly and the arm are mounted on a frame for pivotal movement between an article supporting positon, wherein the receiving and supporting assembly extends horizontally and the lifting arm extends vertically, and an article receiving position, wherein the lifting arm extends horizontally and the receiving and supporting assembly extends vertically. While the assembly is in the latter position, an article is attached to the lifting arm. Then, the assembly is pivoted to the article supporting position. During this movement, the receiving and supporting assembly moves under the article, so that the article is transferred from the lifting arm to the receiving and supporting assembly.

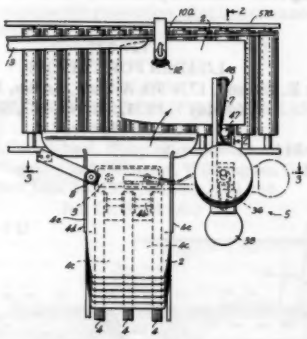
3,727,774
LIFT TRUCK
Maston B. Wolfe, Jr., Dallas, Tex., assignor to Standard Manufacturing Company Incorporated, Dallas, Tex.
Filed Sept. 1, 1970, Ser. No. 68,679
Int. Cl. B66c *23/56*
U.S. Cl. 214—1 D **13 Claims**

A lift truck includes a rear engine, a hydrostatic drive unit mounted just forward of the engine, and an article lifting mechanism mounted just forward of the hydrostatic drive unit. The engine drives the hydrostatic drive unit, and the hydrostatic drive unit propels the lift truck through a pair of rear wheels. The lift truck is guided by a steering mechanism that manipulates a pair of front wheels. An operating compartment



is positioned over the hydrostatic drive unit and includes controls for the hydrostatic drive unit, the lifting mechanism and the steering mechanism.

3,727,775
PICKUP AND TRANSFER DEVICE
Aubrey G. Beazley, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.
Continuation-in-part of Ser. No. 851,303, Aug. 19, 1969, Pat. No. 3,589,320. This application Feb. 23, 1971, Ser. No. 118,053
Int. Cl. B65g *25/04*
U.S. Cl. 214—1 BC **14 Claims**



A fabric workpiece pickup and transfer device having an arm and an adhesive tape trailed over guide means on the arm to which a workpiece is pressed into adhesive contact, a motor for rotating the arm from one position to another, means for advancing the tape, and electrical circuit means for controlling the pickup and transfer functions; means for releasing the workpiece following transfer are also provided and may be operatively interconnected with said device.

3,727,776
AN INTEGRATED SYSTEM FOR LOADING AND UNLOADING CONTAINERS IN OR FROM CONTAINER SHIPS
Pieter Meeusen, Barendrecht, Netherlands, assignor to H. Nielsen & Son Maskinfabrik A/S, Herlev, Netherlands
Filed Jan. 18, 1971, Ser. No. 107,400
Claims priority, application Netherlands, Jan. 21, 1970, 7000818
Int. Cl. B65g *63/00*
U.S. Cl. 214—14 **3 Claims**

A method of and means for loading and unloading containers in or from container ships in connection with the so called containerization, the transfer of each provided with endless conveyors, conveyors at the terminal being on plat-

forms and conveyors in the ship being provided in lanes between the platforms and elevators in the ship, the said conveyors being in alignment to permit streaming of containers from the platforms to the elevators or vice versa. The platforms may be adjustable vertically to come to the level of said conveyors in the ship or to line up with ramps which have conveyors and fold down to provide an opening in the ship-s bow or stern and convey the conveyors in the streams from the platforms to the conveyors in the said lanes of the ship. Upper and lower platforms may be provided and go and return lanes

provided in the ship so that conveyance of containers to the elevators in the ship as streams in one general direction can take place from platforms at one level while the conveyance of containers from the elevator to platforms at a different level at the terminal takes place in the reverse direction. Conveyance from the elevators is to longitudinal holds in the ship which have conveyors which line up with those on the elevators.

Except for gantry cranes at the terminal and in a marshalling area, cranes can be obviated and relatively fast streaming of containers is permitted.

3,727,777

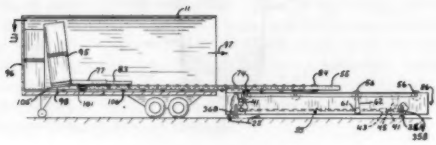
LOADER FOR TRUCKS

Douglas R. Hanson, 1720 9th Avenue, Anoka, Minn.

Filed May 7, 1971, Ser. No. 141,225

Int. Cl. B65g *67/04*

U.S. Cl. 214—41 **11 Claims**



A loader for trucks or other vehicles which can be automatically operated, and which utilizes a loading slide which is initially inserted into a vehicle to be loaded, and which is moved automatically out of the vehicle as loading commences. An interlocking means can be provided for controlling the various functions of the loader assembly, and in this manner the loading can be automatic.

3,727,778

MATERIAL HANDLING SYSTEM

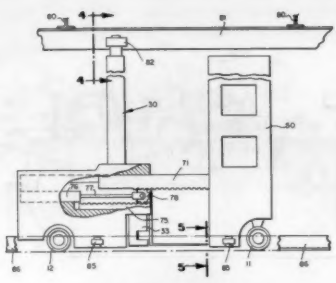
Edwin A. Hollenbach, Paoli, Pa., assignor to Drexel Industries, Inc., Horsham, Pa.

Filed July 8, 1971, Ser. No. 160,600

Int. Cl. B60p *1/44*

U.S. Cl. 214—75 R **3 Claims**

A fork lift truck, in preferred form, has a base frame, a rack frame, a mast, and an operator's platform. There is no center section at the bottom of the vehicle. The assembly is held together at the top with an arch formed by the mast and the truck rack frame. Two tie bars, one on each side on the vehicle, tie the frame together near the bottom. The tie bars are adjustable for height. A rigid mast supports an assembly which includes a carriage having a pivot-and-slide mechanism and a reach mechanism on which the fork is mounted. The pivot-and-slide mechanism permits the reach mechanism and its fork to be rotated and to be slidingly moved transversely from



one side to the other. Thus, the mechanism permits the forks to deposit or to withdraw a load in both forward and side positions. An operator's platform is mounted on the truck forward of the mast.

3,727,779

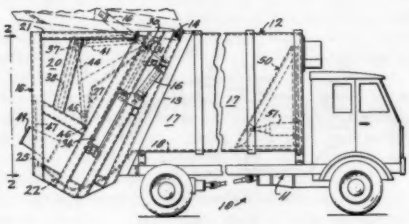
REAR LOADING REFUSE VEHICLE

William A. Herpich, and Donal W. Chaney, both of Galion, Ohio, assignors to Peabody Galion Corporation, Galion, Ohio

Filed Dec. 6, 1971, Ser. No. 204,925

Int. Cl. B65f *3/00*

U.S. Cl. 214—83.3 **7 Claims**



A refuse packing mechanism for the tailgate of a rear loading refuse vehicle is disclosed. A generally L-shaped packer blade is carried at its upper forward end by slide blocks. The blocks are movable back and forth along a generally vertically extending pair of tracks located in the upper forward part of the tailgate. Two similar slide blocks are movable in a similar pair of tracks located rearwardly of the first pair. A thurst link is pivotally connected at one end to each side of the packer blade near its lower trailing edge and at its other end to the slide block on that side of the tailgate. Cylinder and piston mechanisms are connected between the tailgate body and the two pairs of slide blocks for sequentially moving the slide blocks along their tracks for moving the packer blade rearwardly over refuse in the tailgate and forwardly through the bottom of the tailgate to sweep the refuse forwardly into the body of the vehicle.

3,727,780

SCISSORS-TYPE HOIST MECHANISM

Vello S. Bucciconе, Gary, Ind., assignor to Bucciconi Engineering Co., Inc., Gary, Ind.

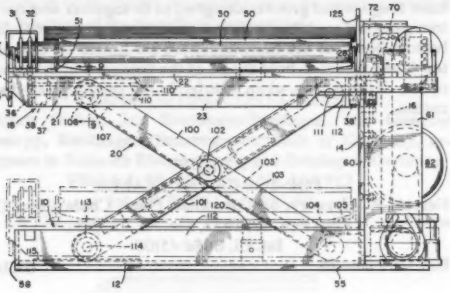
Filed Jan. 4, 1971, Ser. No. 103,709

Int. Cl. B65g *47/00*

U.S. Cl. 214—95 R **8 Claims**

A hoist for use in sheet piling operations or the like which comprises a base frame and a vertically movable platform sup-

ported thereon. The platform is raised and lowered by operation of a single power driven lift screw mounted in an upright end portion of the base frame with the platform being connected to a bottom, horizontally disposed portion of the base frame by a scissors mechanism which holds the platform in a plane parallel with the plane of the horizontal portion of the base frame as the platform is raised and lowered.



3,727,781

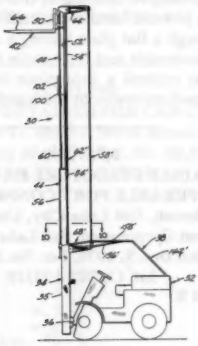
LIFT TRUCK LOAD LIFTING MECHANISM

Keith E. Ramsey, Jackson, Mich., assignor to The Knickerbocker Company, Jackson, Mich.

Continuation of Ser. No. 660,630, Aug. 15, 1967, abandoned. This application Jan. 5, 1971, Ser. No. 104,118

Int. Cl. B66f 9/16

U.S. Cl. 214—701 P **23 Claims**



A load lifting mechanism for lift trucks in which an extensible mast carries a cantilever type load lifting carriage and is vertically actuated by a hydraulic ram and associated load lifting chains. The bending moment created by the load carried on the carriage is counterbalanced by a bending moment derived from load lifting tension elements acting on counterbalancing arms attached to an upper section of the mast, thereby substantially reducing or eliminating bending stresses on the mast regardless of the size of the load being lifted. A pair of laterally spaced chains are utilized as the tension elements in conjunction with laterally spaced counterbalancing arms and similarly spaced chain orienting arms connected to a lower section of the mast and/or to truck anchor points so that lateral as well as fore and aft stability of the mast and associated lift truck is increased. Preferably, the mast is oriented in a fixed upright position relative to the lift truck and a tilting carriage as disclosed herein is used for tilting the forks or other load lifting device attached to the carriage. Several embodiments of counterbalanced masts and telescoping dual rail mast sections and lift chain reeving arrangements are also disclosed.

3,727,782

PACKAGE FOR HOLDING PRESSURIZED FLUENT MATERIALS

Robert L. Doughty, West Hartford, Conn., assignor to Mansanto Company, St. Louis, Mo.

Filed Dec. 28, 1970, Ser. No. 101,960

Int. Cl. B65d 23/00

U.S. Cl. 215—1 C **6 Claims**

A composite package for holding pressurized fluent materials such as carbonated beverages, beer, aerosols and the like, which includes a thermoplastic container having a hemispherically shaped bottom section with a projection extending outwardly therefrom and a support for holding the container in an upright position having an aperture formed in its end wall through which the projection extends, such that the end wall mechanically engages the projection after insertion so as to attach the support to the container.

3,727,783

NONEVERTING BOTTOM FOR THERMOPLASTIC BOTTLES

Keith Stewart Carmichael, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 15, 1971, Ser. No. 153,268

Int. Cl. B65d 1/02

U.S. Cl. 215—1 C **8 Claims**

A generally cylindrical thermoplastic bottle for bottling liquids under pressure such as beer, soda and aerosols, having a noneverting bottom under conditions of bottling and use wherein the bottom comprises at least three lobes around the bottom perimeter of the bottom on which the bottle stands, strap sections located between each lobe and a generally circular and axially aligned, recessed section defining a re-entrant cylinder of the base. To further improve eversion resistance, the bottom of the bottle can include a reinforcing ring attached to the re-entrant cylinder.

3,727,784

CLOSURE FOR BOTTLE

Frank T. Sargent, Nuneaton, England, assignor to Thetford Corporation, Ann Arbor, Mich.

Filed Oct. 20, 1971, Ser. No. 191,021

Int. Cl. B65d 41/04

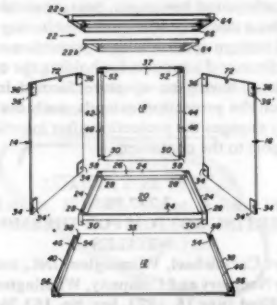
U.S. Cl. 215—40 **4 Claims**

A closure for a flexible bottle made of polyethylene or other material having similar physical properties. The closure and

the bottle are shaped so that when the closure is screwed onto the neck of the bottle sealing occurs between the closure and

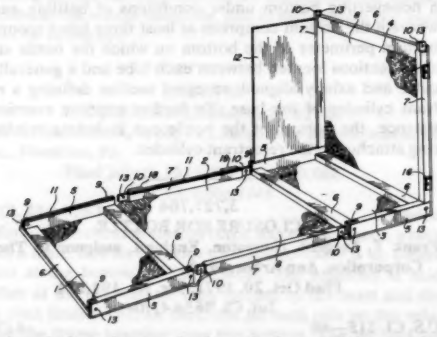
the bottles at the end surface of the neck and at the inner and outer edges of the upper end of the neck.

3,727,785
MOBILE CARGO STORAGE UNIT
David E. Lutz, Carlisle, Pa., assignor to Minicube System, Inc., Carlisle, Pa.
Filed May 7, 1971, Ser. No. 141,199
Int. Cl. B65d *9/12*
U.S. Cl. 217—12 R **4 Claims**



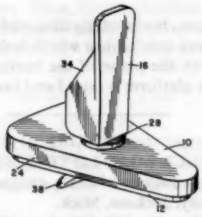
A collapsible container of durable construction including an integral pallet base panel, a pair of end panels, a pair of side panels and a cover panel. The panels are interlocked together in such a manner that the side and rear panels can be removed only after the cover panel and one of the end panels have been removed. When the cover panel is in position the panels are precluded from vertical or lateral displacement.

3,727,786
KNOCK DOWN HAMPER
Anthony O. Fausel, 128 Greenwood Drive, Burlington, Iowa
Filed Feb. 22, 1972, Ser. No. 228,017
Int. Cl. B65d *9/14, 13/00, 7/24*
U.S. Cl. 217—16 **3 Claims**



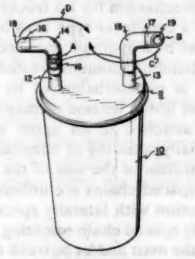
A knock down hamper having a body containing an elongated portion divided into four sections, two of which are enclosed frames and two of which are partially enclosed frames. The frames are covered by a continuous piece of flexible material forming the cover of the hamper and which may be folded to make the hamper fit into a relatively thin and flat shipping and display carton. The top and bottom frame pieces have tongues and grooves designed to fit together and the bottom pieces of each frame have a continuous groove to hold the bottom board of the hamper. There are hinges on one of the top frame pieces to hold the lid of the hamper which fits inside of one of the frames when inserted in the shipping and display carton.

3,727,787
POP-TOP CAN RE-SEALER
Gerrett W. Gregory, 68 Casselman Place, Chula Vista, Calif.
Filed Feb. 22, 1972, Ser. No. 227,931
Int. Cl. B65d *45/00*
U.S. Cl. 220—25 **6 Claims**



A sealer for opened cans, particularly but not necessarily limited to beverage cans, of the pull tab opener type, characterized by its re-usability and economical manufacture. The elongated wedge shaped opening in the end cap of the can is tightly closed, a pivoted handle controlling a vertical spanner bar passing through a flat plate having a compressible sealing element on its underside and the handle has a cam with over-center action to control a crosspiece inserted through the opening and turned crosswise by the handle.

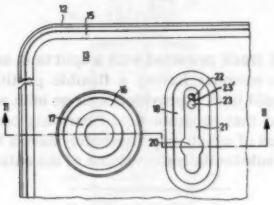
3,727,788
FLUID CONTAINER STRUCTURE HAVING MUTUALLY COOPERABLE PORT CONNECTIONS
Legrand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah
Filed Dec. 9, 1970, Ser. No. 96,341
Int. Cl. B65d *51/16*
U.S. Cl. 220—44 R **11 Claims**



In a fluid container construction having a pair of ports, connector means for providing horizontal connection to such ports, and, additionally, for sealing the interior of the fluid container structure. This is facilitated, in a preferred form of the invention, by the connectors comprising elbows having cooperating, preferably tapered ends which can be placed in

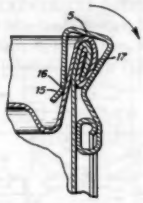
mutual proximity, with a junction cover being provided for sealing off or at least covering such ends at their point of mutual proximity. As the junction cover a collar is preferably provided, and which is slit to accomodate selective expansion and contraction of the collar, depending upon its position relative to the juncture of the two elbow connectors.

3,727,789
TRANSPORTING CONTAINERS
Heinrich Rieber, Jr., Reutlingen-Betzingen, and Gunther Lumpp, Reutlingen-Ohmenhausen, both of Germany, assignors to Heinrich Rieber, Reutlingen-Betzingen, Germany
Filed July 28, 1971, Ser. No. 166,913
Int. Cl. B65d *51/16, 53/02*
U.S. Cl. 220—44 R **1 Claim**



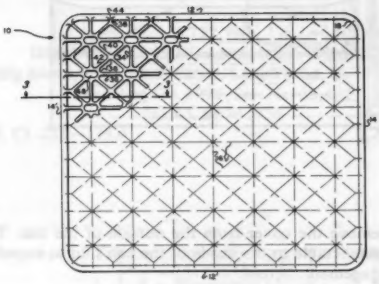
A transporting container having an opening is provided with a cover for tightly closing and sealing the opening. The cover has a portion which fits inside the container and is provided with a flexible sealing member which extends radially beyond the edge of the cover. The flexible member becomes deflected upon insertion into the container and frictionally engages the inside wall surface of the container. An opening is provided in the cover for permitting air to flow into and out of the container.

3,727,790
SPRING CLIP RETAINER FOR CAN CLOSURE
Herbert Arthur Bly, P.O. Box 57, North Brunswick, N.J.
Filed May 26, 1970, Ser. No. 40,582
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 **8 Claims**



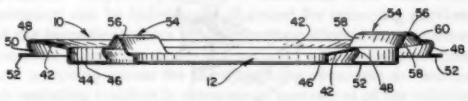
A retainer clip attached to the ring portion of the ring-and-tear-strip easy-opening devices commonly used on metal beverage cans, for the purpose of affixing the ring-and-tear-strip to the rim of the can and thereby conveniently disposing of the ring-and-tear-strip after removal from the can, formed with the minimum distance between the opposite sides of the clip less than the maximum cross sectional thickness of the can rim bead, and with contact points located so that the clip will be retained on the bead of the can rim with a rotational couple acting to press the ring-and-tear-strip against the can side, and formed and located on the lateral periphery of the ring with the open end of the clip on the uppermost side of the ring to ensure convenient placement in the optimum and least conspicious position on the can, thereby precluding interference with normal use of the opened can.

3,727,791
TRAY
Hugh B. Fraser; Lewis T. Johnson; Melvin S. Shutt, and Harry A. Brookshire, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Oct. 8, 1970, Ser. No. 79,109
Int. Cl. B65d *1/34*
U.S. Cl. 220—66 **14 Claims**



A self-draining tray comprising upstanding side and end walls joined in curved junctions at the upstanding edges thereof, and a gridwork bottom member joined in upwardly curved junctions to the lower portions of said walls. Said wall members extend in a generally vertical direction throughout their structure so as to be self-draining, even when said tray is in an inverted position.

3,727,792
ATTACHMENT TO RIM OF A PAINT CAN OR THE LIKE
Myron M. Levin, Highland Park, Ill., assignor to E-Z POR Corporation, Niles, Ill.
Filed June 30, 1971, Ser. No. 158,163
Int. Cl. B44d *3/12*; **B65d** *41/46*
U.S. Cl. 220—90 **10 Claims**

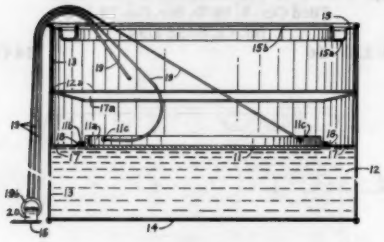


A device comprising an annulus or ring-like member formed of an inexpensive material such as plastic or the like, which is adapted to extend over and embrace the inner and outer annular beads of the rim of a can or container of paint to cover and close the friction groove of the rim and prevent paint or the like from entering the friction groove and/or contact the inner and outer annular beads of the rim, said device having raised means whereby a brush with paint may be pressed thereagainst to cause the excess paint to flow into the interior of the container.

3,727,793
PAINT COVER
Alan M. Staubly, 4940 Colfax Avenue South, Minneapolis, Minn.
Filed April 19, 1971, Ser. No. 135,301
Int. Cl. B65d *87/18*
U.S. Cl. 220—93 **7 Claims**

A cover shaped to float on the surface of paint remaining in a partially used can of paint to keep the air in the can from drying the surface of the paint. The cover preferably has a detachable flexible flange portion that has an outside diameter

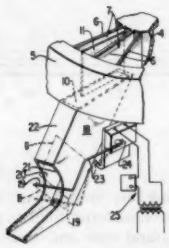
less than the inside diameter of the surrounding can but larger than the diameter of the opening of the can. Lines are provided to remove the cover from the outside of the can. The lines are connectable to the inside of the can's lid to expedite manual engagement thereof.



ERRATUM

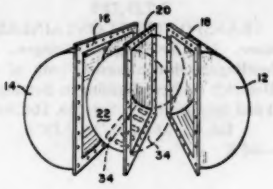
For Class 220—22 see:
Patent No. 3,727,795

3,727,794
MEMORANDUM DISPENSING DEVICE AT PRESELECTED INTERVALS
Jack E. DiEranco, 420 East 58th Street, New York, N.Y.
Continuation of Ser. No. 868,477, Oct. 27, 1969, abandoned. This application Aug. 16, 1971, Ser. No. 172,175
Int. Cl. B65h *29/34*
U.S. Cl. 221—3 **6 Claims**



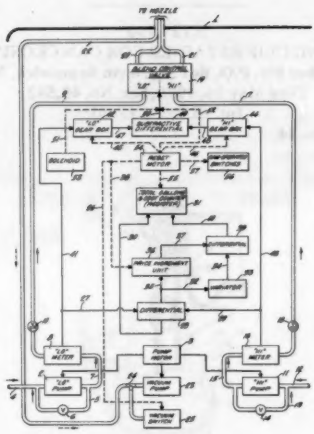
An automatic reminder dispensing memoranda at preselected intervals comprising a constant-speed, substantially-horizontally-rotating drum, said rotating drum being of cylindrical shape and having an outer cylindrical wall and an inner cylindrical wall, the space between said walls being divided by spaced axial walls defining memoranda receiving pockets, a stationary bottom having an opening therein of at least the distance between said cylindrical walls and in cooperation with said spaced axial walls, said rotating drum being spaced slightly from said stationary bottom, means for rotating said drum at constant speed, memoranda means inserted in said memoranda receiving pockets, means in cooperation with said opening in said stationary bottom to deliver said memoranda means at preselected intervals and a signal means in association with said means to deliver said memoranda means.

3,727,795
VEHICLE LIQUID TANK TRANSPORT WITH FLEXIBLE PARTITION
William W. Willsey, Route 82, La Grangeville, N.Y.
Filed Nov. 16, 1970, Ser. No. 89,690
Int. Cl. B65d *85/00*
U.S. Cl. 220—22 **5 Claims**



A liquid tank truck provided with a split tank and a central internal gasket member having a flexible partition of high strength. The split tank is provided with an inlet and outlet in each section so that separate liquid carrying compartments are formed, each of which may alternately have a liquid carrying capacity of substantially the volume of the entire tank.

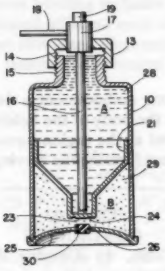
3,727,796
MOTOR FUEL DISPENSING APPARATUS
Einar T. Young, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Division of Ser. No. 85,612, Oct. 30, 1970, Pat. No. 3,705,596, which is a division of Ser. No. 850,901, Aug. 18, 1969, Pat. No. 3,587,337. This application March 17, 1972, Ser. No. 235,702
Int. Cl. G01f *1/04*
U.S. Cl. 222—26 **5 Claims**



An apparatus for dispensing a selected grade of motor fuel (each grade having a different octane rating) has an array of operating pushbuttons a selected one of which may be actuated (the selection being made according to the grade of fuel desired) to start the dispensing operation. Upon the actuation of a pushbutton, certain instrumentalities in the apparatus are energized or released to (among other things) select gearing in the apparatus appropriate to the grade selected, reset the counter or register to zero, set a control valve to a predetermined position, and start up the pump to cause the dispensing of fuel to begin. All of these functions are performed automatically, i.e., without any further human intervention, once

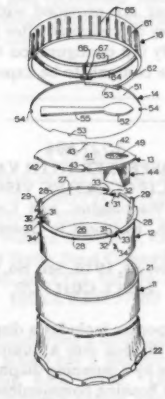
the pushbutton has been actuated. Upon the termination of the actual dispensing, electrical instrumentalities are automatically activated to carry out certain resetting operations, prior to the next dispensing operation. The dispensing apparatus is particularly suitable for a self-service type of operation.

3,727,797
DUAL COMPARTMENT SPRAY CONTAINER
Philip J. Cronan, 1933 South Bedford, Los Angeles, Calif.
Filed Sept. 7, 1971, Ser. No. 178,281
Int. Cl. B67b *7/26*
U.S. Cl. 222—80 **2 Claims**



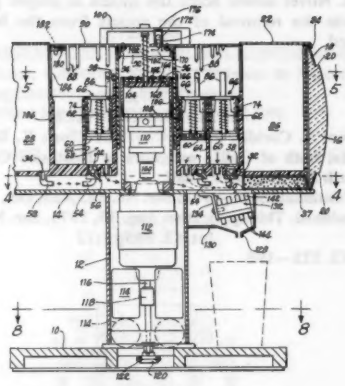
A portable spray can for resin paints incorporates a partition means dividing the interior into first and second chambers for containing catalyst and resin materials respectively. A spray means is threadedly received on one end of the can and includes an elongated rigid tube extending into one of the chambers. The arrangement is such that complete threading of the spray means onto the can urges the tube further into the one chamber to engage the partition means and punch out a portion of this partition means thereby placing the interior chambers in communication with each other. Mixing of the ingredients in the chambers can thus take place prior to a spraying operation, the mixture passing up through the tube and out the spray means when the spray valve is opened.

3,727,798
PLASTIC CONTAINER FOR DISPENSING MEASURED QUANTITIES AND REDUCING HEIGHT OF CONTAINER AS CONTENTS DISPENSED
Jonas C. Harschel, 8 Mariposa Court, Burlingame, Calif.
Filed Nov. 9, 1970, Ser. No. 87,919
Int. Cl. B67b *7/30*
U.S. Cl. 222—87 **7 Claims**



A plastic container is provided with a multi-part lid having a cutting edge which cuts into the side of the container and a dispensing compartment. Upon turning the lid in one direction a measured quantity of contents is forced into the dispensing compartment. Simultaneously a portion of the sides of the container are cut away and stored in a receptacle in the lid, the volume of the container being reduced an amount slightly greater than the quantity of contents dispensed. By turning the lid in the opposite direction the lid components are returned to closed position but the cutting edge of the lid is prevented from turning in a reverse direction.

3,727,799
DRINK DISPENSING AND MIXING SYSTEM
Phillip Nixon, 1352 South Estate, Lake Forest, Ill.
Filed Aug. 20, 1970, Ser. No. 65,471
Int. Cl. B67d *5/56*
U.S. Cl. 222—129.4 **15 Claims**

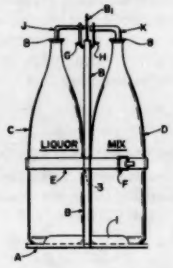


A construction for preparing mixed drinks including a plurality of separate compartments holding a variety of liquid ingredients. Dispensing apparatus associated with each compartment can be individually operated for removing portions of the ingredients from outlet means positioned at a common location. A selector means is associated with the construction, and actuating means for the dispensing apparatus are moved to operating position in response to movement of the selector means. Drive means are provided for automatically achieving dispensing of the desired ingredients. A mixing station is provided for alternative use with the mixing means being driven from the same source as the drive means used for achieving dispensing action.

3,727,800
DRINK DISPENSER AND MEASURING DEVICE
Richard A. Santos, 4128 Margery Drive, Fremont, Calif.
Filed Feb. 22, 1971, Ser. No. 117,558
Int. Cl. B67d *5/56*
U.S. Cl. 222—129 **4 Claims**

A portable drink dispenser and measuring device comprising means for holding a bottle containing liquor and a bottle containing a mix in close proximity to each other and providing a smaller diameter pouring spout for the liquor bottle and a larger diameter pouring spout for the mix bottle, both spouts having their outlet ends spaced a slight distance away from opposite sides of a flexible partition so that the liquids issuing from both spouts in proper proportions when the device is moved into pouring position, will strike the partition and be deflected into a single drinking glass. The flexible partition

serves an additional function in that it can be manually flexed for acting as a valve for closing off or lessening the flow of liquid from either spout so as to make a stronger or a weaker drink. Novel means holds the spouts in proper position and permits the removal of the spouts from the bottles when desired.



3,727,801

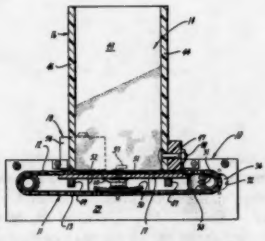
SPRINKLING DEVICE

Andrew A. Caridis, Foster City, and Clark K. Benson, Millbrae, both of Calif., assignors to Heat and Control, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 863,468, Oct. 3, 1969, abandoned. This application Aug. 30, 1971, Ser. No. 176,143

Int. Cl. B65g 3/12

U.S. Cl. 222—196 **15 Claims**



A continuous particle-sprinkling device comprising an endless perforate conveyor, a hopper mounted above the upper conveyor run, and an imperforate surface disposed therebelow. The hopper and surface form a container for the particles through which the upper run passes. In operation, the particles are carried in the conveyor performations of the upper run and over the downstream edge of the surface to pour in a substantially constant stream onto food surfaces passing therebelow. In one embodiment, a vibrator for the conveyor serves to disengage adherent particles from the conveyor and in a second embodiment rappers strike the conveyor falling particles.

3,727,802

HAND HELD FOOD HOLDER AND DISPENSER

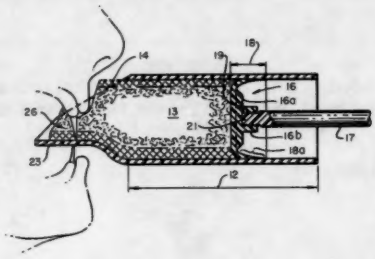
Gerald L. Schnurmacher, 319 Bonita Avenue, Piedmont, Calif.

Continuation-in-part of Ser. No. 785,241, Dec. 19, 1968, abandoned. This application July 20, 1970, Ser. No. 56,618

Int. Cl. A47j 9/00

U.S. Cl. 222—205 **5 Claims**

A generally cylindrical food holder utilizing a plunger at one end driven by a stick to force the contents out the other end. the discharge end of the holder is characterized by a transversely extending sill adapted to be received within the mouth of the consumer to permit the consumer to bite against it while food is supported on it in his mouth. At the lateral side edges of the sill, upwardly extending wall portions serve to confine the bite of food supported on the sill so as to preclude leakage or spilling of fluids from the regions at the corners of the consumer's mouth. In one embodiment a deformable compliant bag is carried within the body of the holder, the upper edge of the bag being secured at the region between the body of the holder and the element forming the serving sill.



3,727,803

CONTAINERS

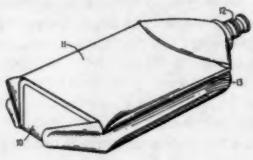
James Campbell Cobb, 16 Cowdry Avenue, Cammeray, N.S.W. 2062, Australia

Filed Dec. 31, 1970, Ser. No. 103,024

Claims priority, application Australia, April 8, 1969, 53084

Int. Cl. B65d 37/00

U.S. Cl. 222—215 **1 Claim**



A collapsible container made preferably from material such as low density polythene for use principally in containing and dispensing viscous or semi-liquid products such as artists' colours the container having thin flexible walls rising from a base and terminating in a neck which may be closed by means of any suitable closure the base being normally flat and sufficiently stiff to provide a support for the container. Opposite walls of the container are provided with at least one fold whereby the walls may be collapsed after the fashion of a bellows to a substantially flat configuration which allows practically the whole of the contents to be expressed from the container.

3,727,804

VISCOUS FLUID DISPENSER WITH VALVED CHAMBER RECEIVING CIRCULATING VISCOUS FLUID

Kenneth A. Smith, Washington, and Lester C. Teague, II, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

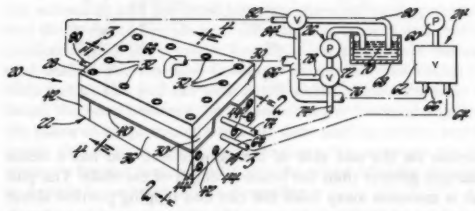
Filed Nov. 30, 1970, Ser. No. 93,528

Int. Cl. G01f 3/20

U.S. Cl. 222—318 **1 Claim**

A viscous fluid dispenser includes a dispenser housing with an elongated cavity divided into a pumping chamber and a viscous fluid chamber by a pumping diaphragm. An elongated dispensing slot in the housing communicates the viscous fluid chamber with the environment and is closed by a control diaphragm in response to fluid pressure supplied to a control chamber in the housing by a valved air pumping arrangement.

A viscous fluid pumping arrangement circulates a viscous fluid through the viscous fluid chamber between a valve controlled inlet and a valve controlled outlet when the dispensing slot is closed by the control diaphragm. The valved air pumping arrangement is actuatable to terminate the fluid pressure supplied to the control chamber, thus opening the dispensing slot, and to subsequently supply fluid pressure to the pumping chamber which causes the valves at the inlet and outlet of the viscous fluid chamber to close and isolate a quantity of the viscous fluid within the viscous fluid chamber. The fluid pressure supplied to the pumping chamber also causes the pumping diaphragm to deflect and force a predetermined amount of the quantity of isolated viscous fluid out of the viscous fluid chamber through the open dispensing slot thereby dispensing the predetermined amount of viscous fluid. In an alternate embodiment, the dispenser housing includes first and second tubular members positioned adjacent each other and opening to each other through an elongated dispensing slot in their common wall. A tubular pumping diaphragm received within the



first tubular member divides the interior thereof into the pumping chamber and the viscous fluid chamber. A tubular control diaphragm received within the second tubular member defines the control chamber which receives fluid pressure from the valved air pumping arrangement to cause the control diaphragm to close the dispensing slot. When the valved air pumping arrangement is actuated, the supply of fluid pressure to the control chamber is terminated and transferred to the pumping chamber whereupon valves at the inlet and outlet of the viscous fluid chamber isolate a quantity of the normally circulated viscous fluid. The fluid pressure in the pumping chamber also defects the tubular pumping diaphragm and forces a predetermined amount of the quantity of isolated viscous fluid through the dispensing slot into the second tubular member and to the environment through a lower dispensing slot in the second tubular member. When the valved air pumping arrangement is deactuated, the control diaphragm expands and forces the viscous fluid remaining within the second tubular member outwardly thereof through the lower dispensing slot.

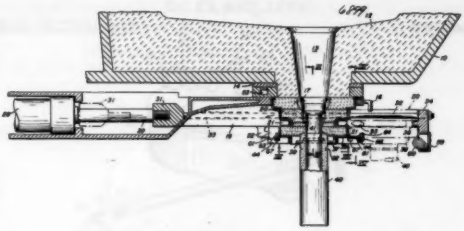
3,727,805

MECHANISM FOR SUPPORTING A SUBMERGED POURING TUBE ON A BOTTOM-POUR VESSEL AND METHOD OF REPLACING TUBES

James T. Shapland, Wilkins Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 24, 1972, Ser. No. 220,232
Int. Cl. B22d *37/00*
U.S. Cl. 222—512 **20 Claims**

A mechanism for supporting a submerged pouring tube on a bottom-pour vessel which has a slidable gate closure, and a method of replacing such tubes. The pouring tube is removably suspended from a holder. The holder is removable and replaceable independently of the gate without disturbing other parts. The replacement holder can be inserted into the mechanism from underneath, where it is temporarily supported in horizontal alignment with the old holder. The same



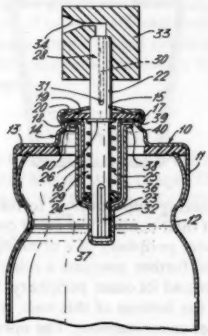
mechanism used to move the gates then is operated to move the replacement holder into the position originally occupied by the old holder.

3,727,806

VALVE ASSEMBLIES FOR AEROSOL CONTAINERS

Kenneth Wilmot, Clitheroe, England, assignor to Neotechnic Engineering Limited, Lancashire, England

Filed May 12, 1972, Ser. No. 252,898
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.2 **7 Claims**



An aerosol container, of the type having a hollow body secured inside the container which cooperates with an elongate valve member operative from outside the container to dispense a predetermined amount only of the contents of the container for each operation, is provided with a second hollow body movable with the valve member and enclosing the first hollow body to form a capillary gap between the two bodies. Provided the container is left in the inverted, dispensing position, the liquid contents are drawn up through the gap by capillary action to fill the inside of the first hollow body ready for dispensing. In this way the container can be virtually completely emptied, minimizing wastage of the contents. The dispensing operation involves a pumping action urging the liquid up through the capillary gap into the first hollow body.

3,727,807

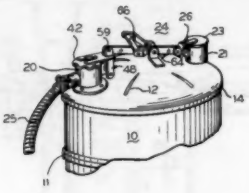
SAFETY CONTAINER FOR INFLAMMABLES

Frank S. Flider, Chicago, Ill., assignor to Justrite Manufacturing Company, Chicago, Ill.

Filed Dec. 14, 1970, Ser. No. 97,713
Int. Cl. A47g *19/14*
U.S. Cl. 222—469 **10 Claims**

A completely enclosed container has two openings or vents. One vent has an internal valve and a pouring spout attached thereto. The other vent has a spring biased safety cap which

raises for filling or to vent vapors when the internal pressure exceeds some predetermined level, such as 5 p.s.i. A handle linkage is connected between the two vents so that the pouring



valve opens first and the venting safety cap opens second, as the can is tipped. Suitable springs urge the valve, cap, and handle to an automatically closed position when the container is sitting at rest.

3,727,808

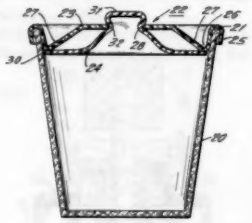
NON-SPILL DRINKING CUP TOP

Leonard C. Fitzgerald, Fairfax, Calif., assignor to Nospil Limited, Los Angeles, Calif.

Filed Aug. 13, 1971, Ser. No. 171,680

Int. Cl. B67d 3/00

U.S. Cl. 222—482 **14 Claims**



A non-spill drinking cup cover is formed of two sections joined together at their center. The outer cover section can be secured to the outer periphery of a drinking cup in a conventional manner and further contains a relatively deep annular well extending around its outer periphery. Openings are provided at or near the bottom of this well, which are normally sealed by the inner cover member. The openings are unsealed by the user pressing down on the outer cover member to resiliently deform or deflect the outer cover member, thereby to move the bottom member down and away from the openings. The annular well may then be filled with fluid from the cup interior by conventionally tilting the cup, and the user may drink from any angular position on the rim of the outer annular well.

3,727,809

CAN END WITH BONDED SEAL SLIDE

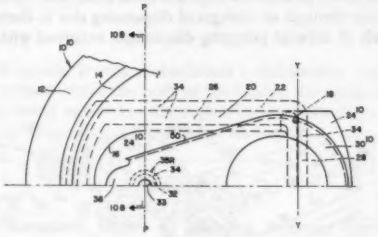
Donald L. Douty, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 61,384, Aug. 5, 1970, Pat. No. 3,622,055. This application Jan. 3, 1972, Ser. No. 214,851

Int. Cl. B65d 47/10

U.S. Cl. 222—541 **61 Claims**

A can end is provided with a pour opening and has a pour width. The pour opening is provided with an entry aperture at one end of the pour opening. The entry aperture has a slide width greater than the pour width. The can end has a can end lapping portion and a can end sealing portion adjacent the pour opening and a plane of bulge strength adjacent the entry aperture. A slide is adapted to pass through the entry aperture and has a slide lapping portion and a slide sealing portion. The slide lapping portion is adapted to register with the can end lapping portion, and the slide sealing portion is adapted to register with the plane of bulge strength. A pull tab has a connection to the slide. Engaging means engage the can end lapping portion to press the can end lapping portion into intimate contact with the slide lapping portion and the slide sealing portion into intmate contact with the plane of bulge strength. A pressure barrier material is providd for sealing lapping contacting can end sealing portion and the slide lapping portion and also for sealing the intimately contacting plane of bulge strength and intimate slide sealing portion. The pressure barrier material is bonded to the can provided sealing portion with a first predetermined shear strength and to the slide lapping portion and to the plane of bulge strength with a second predetermined shear strength less than the first predetermined shear strength. The pull predetermined shear strength. The pull tab has a pivot plane at the connection to the slide, has a pressure



portion on the one side of the connection, and has a beam strength greater than the beam strength of the slide. The pull tab is movable away from the can end lapping portion about the plane of weakness to cause the pressure portion to break the bond between the slide lapping portion and the pressure barrier material adjacent the can end sealing portion so that the pressure barrier material adjacent the can end sealing portion now functions as an exit and reclosure slide guide. The pull tab then is movable to break the bond between the pressure barrier material adjacent the plane of bulge strength and the slide sealing portion and to cause the slide to move through the entry aperture on the pressure barrier material adjacent the plane of bulge strength on such pressure barrier material as a guide to uncover the pour opening.

3,727,810

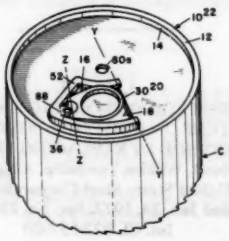
CAN END WITH PIVOTED BONDED SEAL SLIDE

Donald L. Douty, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 146,945, May 26, 1971, which is a division of Ser. No. 61,384, Aug. 5, 1970, Pat. No. 3,622,055. This application Jan. 28, 1972, Ser. No. 221,631

Int. Cl. B65d 47/10

U.S. Cl. 222—541 **45 Claims**



A can end is provided with a pour opening having a pour width. The pour opening is provided with an entry aperture at one end of the pour opening. The entry aperture has a slide width greater than the pour width. The can end has a can end lapping portion and a can end sealing portion adjacent the

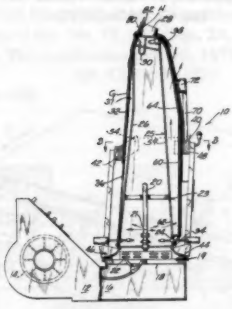
pour opening and a plane of bulge strength adjacent the entry aperture. A slide is pivoted on the can end, is adapted to pass through the entry aperture and has a slide lapping portion and a slide sealing portion. The slide lapping portion is adapted to register with the can end lapping portion, and the slide sealing portion is adapted to register with the plane of bulge strength. A pull tab has a connection to the slide. The pull tab is connected to the can end by a score line. One member of the pivot and the connection press the can end lapping portion into intimate contact with the slide lapping portion and the slide sealing portion into intimate contact with the plane of bulge strength. A pressure barrier material seals the intimately contacting can end sealing portion and the slide lapping portion and also seals the intimately contacting plane of bulge strength and the slide sealing portion. The pressure barrier material is bonded to the can end sealing portion with a first predetermined shear strength and to the slide lapping portion and to the plane of bulge strength with a second predetermined shear strength less than the first predetermined shear strength. The pull tab has a plane of weakness on one side of the connection to the slide and a pressure portion on the other side of the connection. The pull tab is movable away from the can end about the plane of weakness to cause the pressure portion to break the score line and the bond between the slide lapping portion and the pressure barrier material adjacent the can end sealing portion so that the pressure barrier material adjacent the can end sealing portion now functions as an exit and reclosure slide guide. The pull tab then is movable to cause the slide to break the bond between the pressure barrier material adjacent the plane of bulge strength and the slide sealing portion and to cause the slide to move through the entry aperture on the pressure barrier material adjacent the plane of bulge strength as a guide to uncover the pour opening.

3,727,811

STEAM AIR TYPE GARMENT FINISHER

Norman A. Buckley, Wauwatosa, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 11, 1971, Ser. No. 105,214
Int. Cl. A41h *5/00*
U.S. Cl. 223—70 **3 Claims**



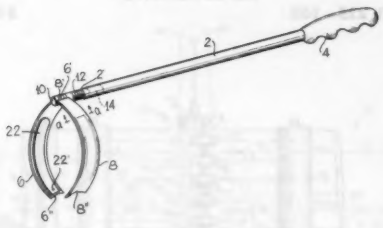
A garment finisher having a form for supporting a garment in a generally natural shape, particularly including collar, tail and breast clamp means for holding the garment tightly dressed on the form; means for diverting part of the garment conditioning and inflating fluid normally discharged through the garment generally to perforated front support means for discharge therefrom directly through the garment overlying the support means; and further particularly including an upwardly open bracket on the rear of the neck block suitable to be easily loaded with a conventional wire hanger and be unloaded to remove the hanger hung finished garment at the end of the operating cycle.

3,727,812

DEVICE FOR APPLYING STOCKINGS AND THE LIKE

Karl G. Weiss, 5 Disraeli St., Haifa, Israel

Filed Dec. 10, 1970, Ser. No. 96,692
Int. Cl. A47j *51/06*
U.S. Cl. 223—111 **6 Claims**



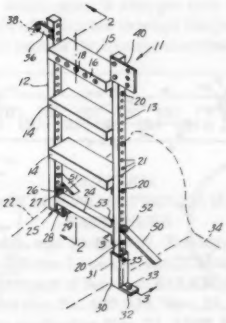
A device for aiding physically-handicapped persons to put on stockings comprises a pair of pivotable arms carried at one end of a handle, the arms being curved toward each other and pivotable from a closed position where they enclose the user's outstretched foot and leg, to open position to permit the device to be withdrawn from the leg by moving it transversely of the leg. The device also includes retaining means for releasably retaining the gathered stocking on the curved arms in the closed position. The arms are additionally provided with an extension pivotable from a folded closed position to an extended open position to enable the device to be used also for putting on underwear.

3,727,813

EQUIPMENT SUPPORTING RACK FOR A POLICE CAR

George W. Eby, 1015 Molalla Ave., Oregon City, Oreg.

Filed Aug. 10, 1971, Ser. No. 170,473
Int. Cl. B60m *11/00*
U.S. Cl. 224—42.42 R **8 Claims**



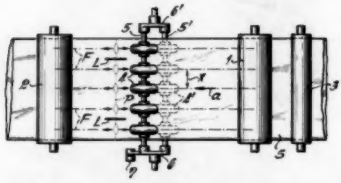
An article supporting rack intended to be installed between the front seat and the dashboard of a police car or similar emergency vehicle. The rack consists of a short vertical side bar secured on the top of the floor hump of the vehicle and a longer vertical side bar secured to the floor board adjacent the hump, the top ends of the vertical side bars being adjacent to the vehicle dashboard. A plurality of shelves are mounted between the side bars for supporting radio equipment and the like.

3,727,814

TEAR-OFF APPARATUS FOR SUCCESSIVELY TEARING OFF A LENGTH FROM THE LEADING END OF A MOVING FLATTENED TUBULAR WEB OF MATERIAL

Gustav Kuckhermann, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Munsterstrasse, Germany

Filed March 4, 1971, Ser. No. 120,916
Claims priority, application Germany, March 9, 1970, P 20 11 101.7
Int. Cl. B26f 3/02
U.S. Cl. 225—100 5 Claims



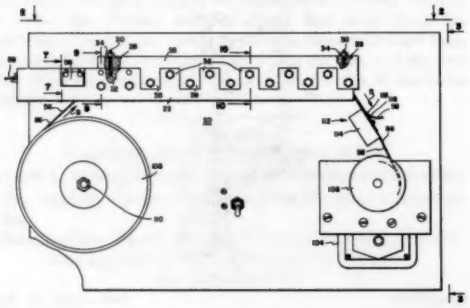
A tear-off apparatus for lengths of flattened tube from a transversely scored or perforated single or multi-ply paper or plastic moving tubular web including a pair of holding rolls adapted to turn at no more than the web feeding speed, a pair of tear-off rolls downstream of the holding rolls and adapted to turn faster than the web feeding speed and at least two rows of deflector rollers for the web extending transversely of the web downstream from the holding rolls and upstream of the tear-off rolls, said rollers being adapted to make substantially point contact with the web.

3,727,815

MEANS AND METHOD FOR TRANSPORTING A PHOTOGRAPHIC STRIP

Theodore F. Schwartz, 11660 St. Andrews Way, Scottsdale, Ariz.

Filed Oct. 28, 1971, Ser. No. 193,488
Int. Cl. B65h 17/28
U.S. Cl. 226—5 16 Claims



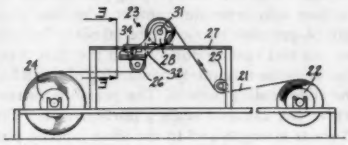
A means and method for transporting a photographic section of material by securing tape to a marginal edge of said material and applying tension to the tape for pulling said section through a processing area from a first position to a second position; and means for separating said section from said tape after said tape has pulled said section through said processing area.

3,727,816

WEB-GUIDING APPARATUS

Pasquale Meneo, 57 Lakeview Avenue, Hamden, Conn.

Filed Dec. 27, 1971, Ser. No. 212,210
Int. Cl. B65h 25/26
U.S. Cl. 226—19 12 Claims



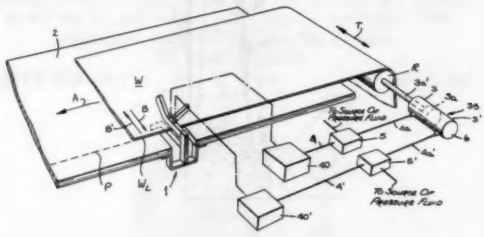
Web-guiding apparatus having a plurality of pairs of web stretching slats supported across the peripheries of disks for rotation about a shaft, wherein the slats are independently movable longitudinally of the shaft. A cam follower is mounted under each slat at each end of each pair of slats and projects inwardly. Feelers sense deviations of the edges of the web from predetermined locations defining a passage for the web. A pair of circumferential cams are mounted one on each portion of the shaft, each cam having an inclined circumferential channel for receiving a cam follower and for defining a range of positions for the cam follower longitudinal of the axis of the shaft. The cams are independently rotatable in response to the feelers such that the slats are movable through the range of positions to restore the edges of the web to the predetermined locations.

3,727,817

EDGE SENSING APPARATUS

Raymond S. Tibavido, Seaford, N.Y., assignor to Leigh Systems, Inc., Syracuse, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,329
Int. Cl. B65h 25/26
U.S. Cl. 226—19 12 Claims



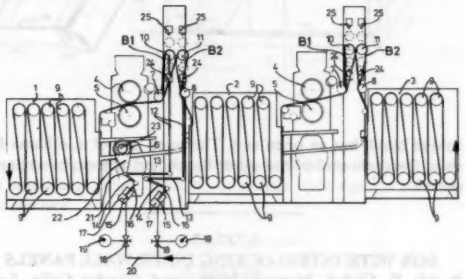
Apparatus for detecting the presence of a web material at a given location, including a movable member at the location, having a conduit therethrough, and pressure fluid means cooperating with the movable member for discharging through the conduit when no web material is present at said location and for building up pressure behind the movable member, for urging the latter against the web material when the web material is present at said location. Sensing means cooperate with said fluid pressure means for detecting such build up of pressure.

3,727,818

APPARATUS FOR GUIDING WEBS IN AN EXTENDED CONDITION

Willi Probst, Uzwil, Switzerland, assignor to Mashinenfabrik Benninger A.G., Uzwil, Switzerland

Filed July 21, 1971, Ser. No. 164,585
Claims priority, application Switzerland, July 31, 1970, 11519/70
Int. Cl. B65h *25/04*
U.S. Cl. 226—44 5 Claims



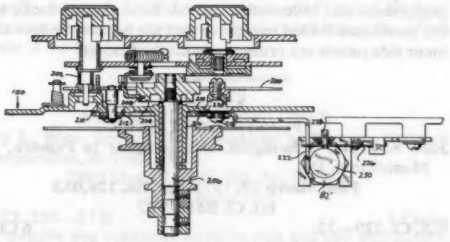
An apparatus for simultaneously guiding a number of webs, especially textile webs, in an expanded condition adjacent one another, comprising common drive means for the webs, and movable tension regulating rolls arranged between said common drive means. The tension regulating rolls impart a predetermined tension to the webs traveling thereover, and such tension regulating rolls are mounted to be movable so as to deflect or travel out of a reference position as a function of web elongation or contraction in order to correct the speed of the associated drive means. These tension regulating rolls extend over the entire width of the apparatus and are each individually associated with a given separate web for taking up the elongation or contraction of such associated web.

3,727,819

FEED MEANS FOR OPTICAL DISPLAY DEVICE AND CONTROL SYSTEM THEREFOR

Max Kotler, 2 Surry Lane, Montvale, N.J., and Frank E. Ravese, 1856 Marine Parkway, Brooklyn, N.Y.

Division of Ser. No. 75,158, Sept. 24, 1970, Pat. No. 3,690,746. This application Oct. 20, 1971, Ser. No. 191,083
Int. Cl. G03b *1/22*
U.S. Cl. 226—46 10 Claims



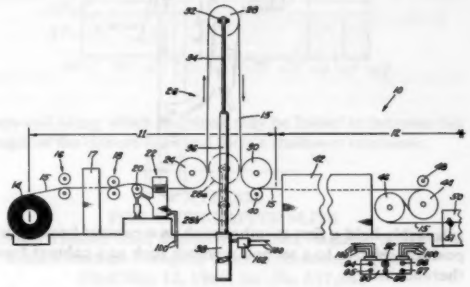
A feed structure for a film projector is disclosed which is specially adapted to permit and inhibit feeding under the accurate and synchronized action of an electrical signal. The signal positions an electromagnetically actuated stop which coacts with the film feeding element so as to inhibit movement of that element only after the element has reached a predetermined position in its normal cycle of movement.

3,727,820

METHOD AND APPARATUS FOR CONTINUOUSLY PROCESSING STRIP

Curt Braun, Riverside, Calif., assignor to Hunter Engineering Co., Riverside, Calif.

Filed Feb. 18, 1972, Ser. No. 227,356
Int. Cl. B65h *17/42*
U.S. Cl. 226—113 7 Claims



In a high-speed strip line having a processing section, through which strip must continue moving without interruption, there is a first, normally-full accumulator located ahead of the processing section, and a second, normally-empty accumulator located beyond it. Each of the accumulators has a storage capacity to allow strip to creep through the processing section at a very slow speed for a limited period of time, while one or both ends of the lie are shut down to perform a servicing operation. Thus, in one case, strip is paid out of the first accumulator while the entry end on the line is shut down, and creeps through the processing station to the takeup coil. In another case, strip is taken from the payoff coil and creeps through the processing station to the second accumulator, where it is stored while the delivery end of the line is shut down. In a third case, strip is paid out of the first accumulator and creeps through the processing section to the second accumulator where it is stored while both ends of the line are shut down. In each case, the line is slowed down from full speed to creep speed, at which point it changes over automatically to creep speed mode of operation through the processing station, while one or both ends of the line are shut down.

3,727,821

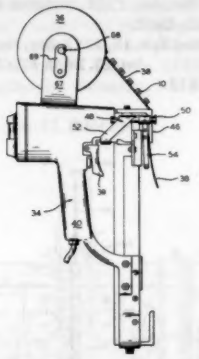
TOOL FOR ATTACHING IMPROVED WING HEADED FASTENERS

Richard W. Pabich, and Richard W. Trieber, both of Chicago, Ill., assignors to Acme Lane Co., Inc., Chicago, Ill.

Continuation-in-part of Ser. Nos. 615,830, Feb. 13, 1967, abandoned, and Ser. No. 689,939, Nov. 24, 1967, Pat. No. 3,429,013. This application Nov. 21, 1968, Ser. No. 777,652
Int. Cl. B27f *7/02*
U.S. Cl. 227—120 16 Claims

Tool attachments associated with air tools that force nails or other fasteners into members. Uniquely formed wing headed fasteners and the tool attachments are correspondingly adapted to each other to enable the wing headed fasteners to be pivotally mounted to said members with the nails from the tool for releasably holding a first member, such as a cabinet backing in a position relative to a second member such as a cabinet frame therebehind. The attachments are associated with air tools, or the like, to force nails through uniquely

formed wing headed fasteners to hold same so that the wing headed fasteners are pivotally mounted to a member to releasably hold a first member such as a cabinet backing in a position relative to a second member such as a cabinet frame therebehind.

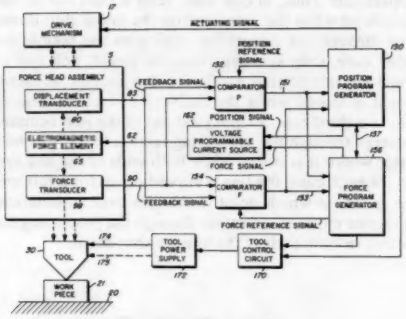


3,727,822

ELECTROMAGNETIC FORCE SYSTEM FOR INTEGRATED CIRCUIT FABRICATION

Charles Wayne Umbaugh, Phoenix, Ariz., assignor to General Electric Company, Phoenix, Ariz.

Division of Ser. No. 78,039, Oct. 5, 1970, Pat. No. 3,697,837.
This application Nov. 10, 1971, Ser. No. 197,406
Int. Cl. B23k *1/06, 5/20*
U.S. Cl. 228—1 **3 Claims**



A feedback controlled spacial-force mechanism is used with a variety of tools for integrated circuit fabrication. The mechanism utilizes a force producing element having a force which may be held constant over a practical range of displacement. An optical-mechanical tool is also provided having an optical surface for contacting and bonding an integrated circuit work piece for effecting interconnection of circuit elements.

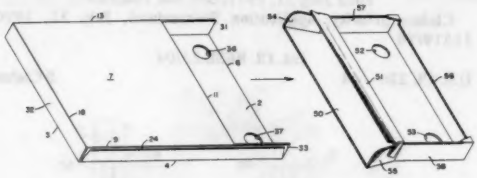
3,727,823

CONTAINER

William S. Sullivan, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed March 31, 1971, Ser. No. 129,810
Int. Cl. B65l *5/00*
U.S. Cl. 229—16 R **4 Claims**

A box for retaining a stack of paper sheets and adapted to feed the sheets one by one to a copying apparatus. The box is formed from two folded blanks each having a top panel, a bottom panel, two side panels and one end panel so that each folded blank has an open end. The open end of one blank fits over the open end of the other blank and any exposed paper sheets.

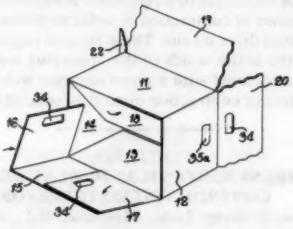


3,727,824

BOX WITH INTERLOCKING INNER WALL PANELS

Buddy E. Giebel, Monroe, Mich., and Charles Calia, Lancaster, Pa., assignors to Union Camp Corporation, Township of Wayne, N.J.

Filed Dec. 28, 1971, Ser. No. 213,032
Int. Cl. B65d *5/00*
U.S. Cl. 229—16 R **6 Claims**



A four sided box formed from a substantially rectangular blank having reinforced side walls formed of inner and outer side panels, which inner side panels are extensions of the outer side panels folded to lie flat against the inner faces of the walls, the adjacent edges of the inner side panels having matching projections and indentations which form mating locks when the panels are folded into place and the adjacent edges of the inner side panels are pressed against each other.

3,727,825

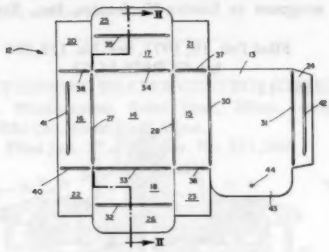
PLASTIC CONTAINER

John S. Troth, Wilmington, Del., assignor to Pamark, Inc., Montchanin, Del.

Filed March 19, 1971, Ser. No. 126,053
Int. Cl. B65d *5/22*
U.S. Cl. 229—32 **6 Claims**

A container of sheet plastic construction is provided, constructed generally of a single sheet of material, with fold lines thereof being applied under heat and pressure, to facilitate ready folding of the container from flattened blank form, by the use of preferably conventional folding machinery. The container corner constructions are of especially deep construction, and have "dished," or tapered ends, to facilitate handling of nested stacks of container blanks, such as ready transfer of one blank in a stack laterally thereof, by high speed machinery. A re-closable snap type lock is also provided for

the container, as well as a hang tab. In the folded form, the containers have protruding corners, which cooperate, when a



plurality of containers are packaged, to act as spacers, with the container corners spacing container walls against scuffing and the like.

3,727,826

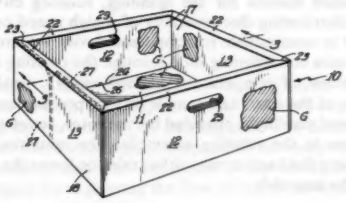
CROSS PLAY DOUBLE WALL TRAY

Charles J. Shepherd, Pasadena, Tex., assignor to Container Corporation of America, Chicago, Ill.

Filed March 26, 1971, Ser. No. 128,247

Int. Cl. B65d *5/22*

U.S. Cl. 229—34 R **1 Claim**



A multi-wall tray is formed from a cut and scored blank of corrugated container board or the like. In cutting and scoring the blank all of the score lines are inclined at an angle, preferably 45°, to the flute direction of the board. When the blank is folded to define the tray structure, the tray walls consist of plies of different flute orientation resulting in good stacking strength, at least ten per cent better than trays having normally oriented flutes in the corrugated board thereof. Moreover, there is a saving in board in orienting the blank therein in the fashion described.

3,727,827

VARIABLE SIZE CONTAINER

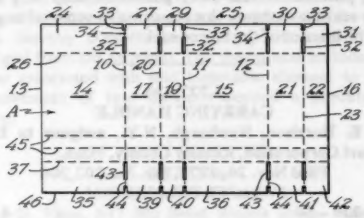
Larry L. Stice, Keokuk, Iowa, assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed May 25, 1970, Ser. No. 40,311

Int. Cl. B65d *5/02*

U.S. Cl. 229—37 R **1 Claim**

A variable size container includes side and end wall panels, and top and bottom closure flaps are hinged to the upper and lower edges thereof. A pair of additional score lines, parallel to those connecting the wall panels, divide the end wall panels into two side or end wall panels, either of these side-by-side side or end wall panels being foldable into the plane of the side wall panel to which it is connected when the ends of the blank are secured together and the container folded into rectangular form. Interrupted slots are provided between the adjoining flaps to permit easy severing of the flaps at the corners of the container while the other slots remain unsevered. Fold lines extending across the side and end walls adjoining at least one fold line connecting the side and end wall panels to the closure



flaps and along which the blank may be folded to increase the length of the closure flaps and form a shallower container.

3,727,828

FOIL OVER-LAPPED SLITS

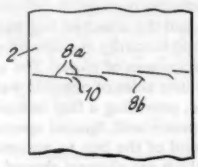
Charles Thomas Hall, Deptford, London, England, assignor to Molin's Machine Company Limited, London, England

Filed May 12, 1967, Ser. No. 637,968

Claims priority, application Great Britain, May 20, 1966, 22,710/66

Int. Cl. B65d *75/62*

U.S. Cl. 229—51 C **1 Claim**



An inner wrapper enclosing the contents, e.g. cigarettes, of a container has a row of slits extending across its width, the slits being obliquely arranged and slightly overlapping each other, to facilitate separation and removal of one part of the wrapper from another.

3,727,829

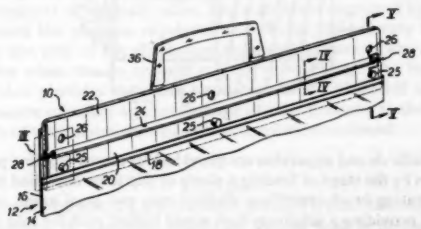
CLOSURE DEVICE FOR PLASTIC BAGS

Christian Huni, Ris Orangis, France, assignor to Michel Claude Jean Mazereu, (Loir-et-Cher), France

Filed Feb. 19, 1971, Ser. No. 117,018

Int. Cl. B65d *33/16*

U.S. Cl. 229—54 R **10 Claims**



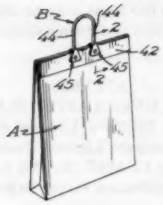
A closure device for plastic bags or sacks formed as a one-piece body of molded plastic and comprises a plate with upper and lower portions and an elongate slot provided therebetween, cooperating latching elements arranged in the portions for latching engagement with one another, and hinges disposed at the ends of the elongate slot connecting the portions of the plate to each other. Projections extending from

the facing edges of the plate portions at the hinges for limiting the pivoting zone of the hinge and therefore facilitating the alignment of the latching portions in bringing them into latching position. A tear-away guarantee strip may be provided to seal the elongate slot requiring its removal to gain access to the interior of the bag or sack.

3,727,830
CARRYING HANDLE

Robert E. Harrison, Newburgh, N.Y., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.

Filed Nov. 26, 1971, Ser. No. 202,204
Int. Cl. B65d *33/00*
U.S. Cl. 229—54 4 Claims

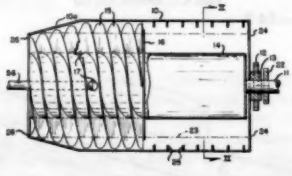


A bag is provided having an elongated reinforcing strip secured to its inner surface along the upper bag end. A fold line extends longitudinally through the reinforcing strip parallel to the strip sides and the attached bag wall and permits the upper bag edge to fold inwardly and downwardly to provide a bag edge of four thicknesses of paper. The upper edge of the bag is slit along opposite sides of one side wall from the upper edge to the fold line, providing a flap independently foldable outwardly of the opposite wall. Spaced apertures are provided through the upper end of the bag to accommodate a handle strap, the ends of which are channel-shaped and support pins to extend through the apertures, holding the bag closed and providing a bag handle.

3,727,831
METHOD AND APPARATUS FOR CLASSIFYING FINE PARTICLE MATERIALS

Sanford C. Lyons, Bennington, Vt., assignor to Georgia Kaolin Company

Filed Aug. 31, 1970, Ser. No. 68,391
Int. Cl. B04b *1/00*
U.S. Cl. 233—7 10 Claims

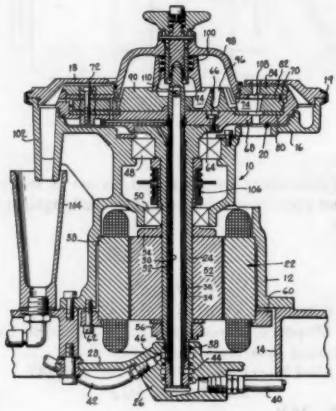


Methods and apparatus are provided for classifying fine particles by the steps of feeding a slurry or slip to be classified into a rotating bowl centrifuge divided into two pool areas, one pool providing a relatively high speed helical path for said slip wherein coarse particles are thrown to the periphery of the bowl and carried outwardly and a second pool providing a relatively low speed path over a ribbon type conveyor wherein intermediate size particles are thrown into the ribbon conveyor and returned along the bowl periphery to the first pool where they are intermingled with the coarse particles there thrown out of suspension and discharged and an effluent port for the remaining slurry.

3,727,832
TEMPERATURE CONTROL FOR CENTRIFUGAL ANALYZER

Ernest Maclin, Paramus, and Abe J. Perle, Verona, both of N.J., assignors to Electro-Nucleonics, Inc., Essex County, N.J.

Filed Feb. 19, 1971, Ser. No. 116,884
Int. Cl. B04b *15/02*
U.S. Cl. 233—11 1 Claim

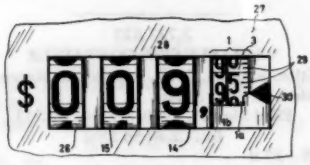


Disclosed is a method and apparatus for providing close temperature control for the spinning, rotating cuvette and sample distributing disc assembly of a high speed centrifugal analyzer or comparable rotating head device by circulating a temperature conditioning fluid through the rotating assembly. This method of temperature control assures rapid thermal response of the rotor and sample so that precise temperature control and stability is provided for the rotor, cuvettes and test specimens in the rotating assembly. The conditioning fluid may be any fluid and it may either raise or lower the temperature of the assembly.

3,727,833
INDICATION CORRECTING ARRANGEMENT FOR COUNTERS

Helmuth Muller, St. Georgen, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany

Filed June 5, 1972, Ser. No. 259,875
Claims priority, application Germany, June 5, 1971, P 21 27 966.3
Int. Cl. G06c *27/00*, *15/42*
U.S. Cl. 235—117 R 12 Claims



A monetary counter has counter wheels for dollars and cents. The counter wheel of the lowest order counts cents up to 100, and represents the two lowest orders by first and second indicia on first and second counter wheel halves which are normally connected by coupling means. The second counter wheel half is connected by tens transfer means with the counter wheel counting and indicating dollars. When the value 99 cents is approached, the tens transfer means already turn the dollar counter wheel so far that it begins to show the

following digit instead of the actually counted digit, causing errors. Resetting means are operated before reading out the counter, and reset the second counter wheel half, and thereby the dollar counter wheel, to a position indicating the actually counted dollars and cents.

3,727,834

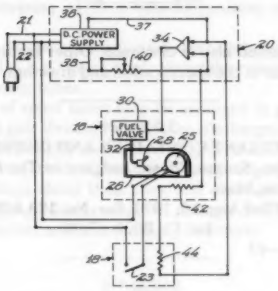
ENTRY SENSING HEATER CONTROL SYSTEM

Richard N. Weatherston, Saint Paul, Minn., assignor to Weather-Rite Inc., Saint Paul, Minn.

Filed Jan. 27, 1972, Ser. No. 221,269

Int. Cl. F23n *5/14*

U.S. Cl. 236—9 **7 Claims**



A control system for entryway heating units which is responsive to both the temperature of the entryway and the discharge temperature of the heating unit. The combined resistance of two thermistors positioned in the entryway and in the discharge stream from the heater is monitored to derive a control signal for regulating the flow of fuel to the heater.

3,727,835

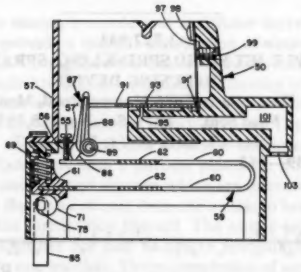
CEILING AIR TERMINAL

Ernest Rifkin, Dewitt, and William E. Clark, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed July 1, 1971, Ser. No. 158,820

Int. Cl. F24f *7/00*

U.S. Cl. 236—49 **1 Claim**



A ceiling air terminal serving as part of an air conditioning system for a building adapted to discharge conditioned air into an area to be treated. The terminal is provided with a bleed-type thermostat employing a bimetallic element movable in response to temperature variations in the air passing over the element from the area served by the air terminal. The bimetallic element regulates the quantity of air bled from the thermostat to thereby control the quantity of conditioned air discharged from the terminal. The thermostat includes a stop member associated with said bimetallic element to prevent any movement of said element beyond a predetermined distance.

3,727,836

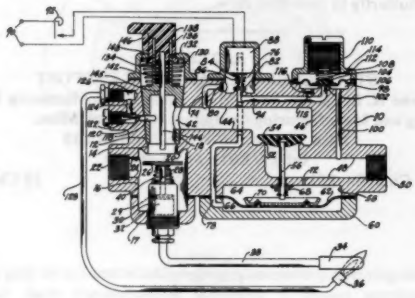
MANIFOLD GAS VALVE

Charles D. Visos, 817 Big Bend Woods Drive, Manchester, Mo.; John J. Love, 1324 Graham, St. Louis, Mo.; Carl A. Smith, 766 Peal Drive, and Ralph E. Banes, 2323 Rose Garden Drive, both of St. Louis, Mo.

Filed Oct. 26, 1971, Ser. No. 192,431

Int. Cl. F16k *31/12*

U.S. Cl. 236—80 **5 Claims**



A gas valve device in which a biased closed main valve having a diaphragm operator controls the main flow of fuel therethrough from inlet to the main outlet. Inlet pressure is applied to one side of the diaphragm to move the valve open; the other side of the diaphragm is constantly exposed to outlet pressure. A first restricted passageway leads from the inlet to the one side of the diaphragm and has an "on" and "off" control valve therein. A second passageway leading from a point in the first passageway between the control valve and diaphragm to the main outlet has a pressure regulator valve therein a nd bleeds off a portion of the inlet pressure being supplied to the one side of the diaphragm through the first passageway at a regulated rate thereby to regulate the opening movement of the main valve, and a constant restricted bypass around the pressure regulator valve vents the pressure from the one side of the diaphragm to permit closure of the main valve when the on and off control valve closes. The bypass further provides smoother regulation of the bleed off and a measure of safety against leakage of inlet pressure to the one side of the diaphragm when the control valve is closed.

3,727,837

TEMPERATURE RESPONSIVE VALVE MECHANISM

Raymond W. Gazzera; Donald A. Nordal, both of Scottsdale, and Robert A. Null, Temple, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

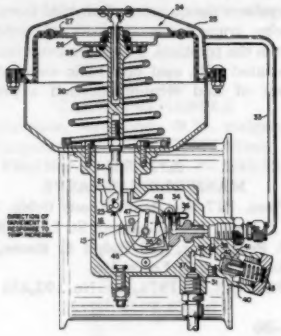
Continuation of Ser. No. 850,479, Aug. 15, 1969, abandoned. This application June 21, 1971, Ser. No. 155,359

Int. Cl. F15b *13/16*; G05b *6/04*

U.S. Cl. 236—87 **12 Claims**

Valve mechanism has a butterfly with an actuator biased toward valve open position by a spring and toward valve

closed position by fluid pressure. Means responsive to the temperature of fluid adjacent the butterfly are provided to effect controlled bleed of pressure from the actuator to cause the butterfly to modulate flow.



3,727,838

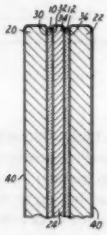
STEEL-CERAMIC RAILJOINT ENDPOST

Eugene H. Bergh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed July 26, 1971, Ser. No. 166,203

Int. Cl. E01b *11/58, 26/00*

U.S. Cl. 238—152 **10 Claims**



An electrically insulating railjoint endpost having steel face plates and at least one high compressive strength thin insulating ceramic spacer sheet adhesively bonded on each face to steel face plates or steel filler plates. At least the edges are peripherally protected by a nonconducting polymeric coating, conveniently by coating of the entire endpost.

3,727,839

AGGLOMERATING POWDERED PRODUCTS

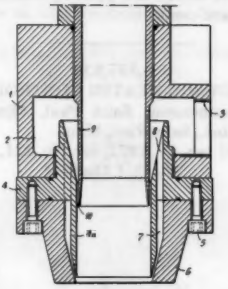
William Cornelius Marsh, Marysville, Ohio, assignor to Societe D'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Division of Ser. No. 835,173, June 20, 1969, Pat. No. 3,622,081. This application Sept. 21, 1971, Ser. No. 182,357

Int. Cl. A01n *17/02;* **A62c** *1/12*

U.S. Cl. 239—8 **2 Claims**

A process for agglomerating powdered materials in which the materials are discharged from the aperture of a conduit while simultaneously a stream of an aqueous medium is discharged codirectionally with the particulate material and in a course encircling the aperture with a second aqueous stream being discharged in an encircling course around the particulate material stream within the conduit at a location upstream of the aperture. A nozzle for agglomerating powdered materials, especially food products, which comprises at least two annular steam inlets into a central duct through which the material is passed also is disclosed. Other features of the invention appear in the specification and drawings.



3,727,840

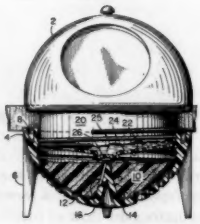
DISPERSANT CONTAINER AND DISPENSER

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 19, 1971, Ser. No. 173,049

Int. Cl. B05b *17/00*

U.S. Cl. 239—43 **4 Claims**



Container for dispersant material comprising first and second members adapted to be movably connected together, the first member having wick means disposed therein in communication with a surrounding atmosphere, the second member having therein a sealed reservoir containing fluid dispersant material, the first member further including means for opening the reservoir, whereby upon relative movement of the first and second members toward each other the reservoir opening means operates to open the reservoir, permitting flow of the dispersant material therefrom onto the wick means.

3,727,841

MULTIPLE JET FLUID SPRINKLING, SPRAYING AND DIFFUSING DEVICE

Robert W. Hengesbach, 7886 Munson Road, Mentor, Ohio

Filed Sept. 7, 1971, Ser. No. 178,355

Int. Cl. A01g *25/14;* **B05b** *1/20*

U.S. Cl. 239—145 **9 Claims**

Small diameter, normally straight tubes, some having discharge ports distributed along their lengths, and some being imperforate, are detachably connected in selected orders to

form an elongated dispensing pipe line which is connectable at one end to a source of fluid under pressure and is plugged at the other end. The tubes are readily flexible transversely of their axes into curvilinear shapes throughout a wide range of radii, ranging from about 6 inches upwardly, by forces applied by the hands of an operator while his hands directly grip the tube. The tubes retain their normal cross sectional shape when so curved. They are of a plastic material having a good memory so that they are self-restoring or readily restorable manually to original lineal condition by reverse bending by hand. They are highly resistant to permanent or elastic deformation, or radial collapse, of their cross section. The tubes are so fully resistant to torsional deformation by manually applied forces and the coupling between the tubes hold the tubes so tightly that an operator, by applying rotational or torsional forces to any one of the tubes manually while gripping it directly in his hands, can rotate the entire line as a unit with each tube retaining its fixed rotated position relative to the others.

The tubes can be connected together with the ports of any tube directed at a different angle about the common axis from the ports of other tubes.

The ports of some tubes may be arranged in pairs with the ports of each pair directed so that the discharged jets impinge on each other abruptly and create a fog or mist.

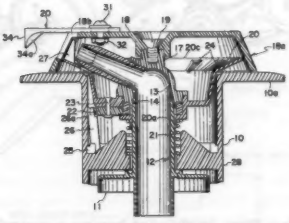
The tubes may be detachably connected together in various rotated positions about their axes, and also with their axes in various angular positions resistive to each other for building temporary shower and auto washing structures.

3,727,842

AGRICULTURAL SPRINKLER HEAD

Byron L. Ertsgaard, and Edwin J. Hunter, both of Riverside, Calif., assignors to Toro Manufacturing Corporation, South Minneapolis, Minn.

Filed June 24, 1971, Ser. No. 156,381
Int. Cl. B05b *3/08*
U.S. Cl. 239—232 **25 Claims**



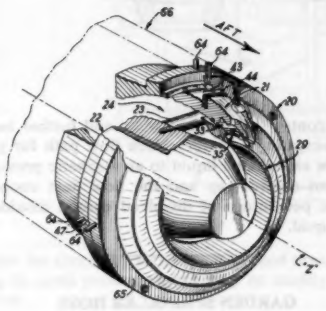
A sprinkler having a nozzle and a diffuser therefor which cooperate to provide a variable distribution of water from the sprinkler head throughout the entire circumference thereof which accomplishes almost complete uniformity of distribution of the water within the maximum and minimum limits of projection of the eater stream from the head. The nozzle is continuously driven in a circular direction and intermittently rotates simultaneously with a diffuser plate, the diffuser having diffuser vanes formed thereon which are intermittently interposed into the water stream from the nozzle to break up the pattern and the distribution thereof. The nozzle and diffuser plate travel together for one complete revolution, in fixed relationship to one another. Upon completion of each revolution, the nozzle disengages itself momentarily from the diffuser plate, and indexes itself relative to the diffuser plate a predetermined incremental distance, whereupon it re-engages and makes another complete revolution, so that the nozzle is constantly changing its relationship with respect to the diffuser plate, and the water dispersing or diffusing vanes provided thereon. The relative indexing of the nozzle and the diffuser plate is accomplished by a gear formed on the nozzle, and a pinion carried by the diffuser plate, which pinion engages the gear on the nozzle, and also engages each complete revolution, a stationary pin which is the equivalent of one tooth of an internal gear. When the pinion engages the pin, it causes the aforementioned disengagement of the diffuser and nozzle and indexing of the nozzle to the next diffuser station or vane.

3,727,843

DUCT-FORMING ASSEMBLIES AND VECTOR CONTROL

Arthur R. Parilla, Box 127, Mountain Lakes, N.J.

Filed July 16, 1969, Ser. No. 842,149
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.35 **35 Claims**



A pair of concentrically arranged members defining an annular duct therebetween including a throat section of minimum cross-sectional area are rigidly interconnected and universally mounted for omnidirectional rotation as a unit within an outer annular housing having an inner spherical seat. Two mutually independent rotational actuating systems, each employing a diametrically opposed pair of fluid cavity actuators built into the outer duct-forming member and pivotally mounted on the outer housing, provide simultaneous rotational control about two mutually orthogonal diametrical axes passing through the spherical center of rotation of the members and the pivot axes of the two actuator pairs. The upstanding walls of each actuator cavity are defined by a floating sealing member. Throat area adjustability is provided by an independently controlled annular throat adjusting segment which is constrained to translational motion along the duct axis relative to the inner member and has an axially skewed throat defining surface. Control over the position of the throat adjusting segment is via a toroidal bladder having a rectangular cross-section.

3,727,844

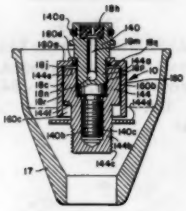
DISPENSING APPARATUS

Robert S. Bencic, Chicago, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed April 30, 1971, Ser. No. 139,031
Int. Cl. F23d *13/38*
U.S. Cl. 239—414 **9 Claims**

An adjustable carbonated liquid dispensing nozzle is provided which maintains a high percentage of dissolved carbon dioxide in the liquid being dispensed. The dispensing nozzle is coupled to a control valve which controls the flow of carbonated liquid to the dispensing nozzle. The control valve may also selectively control the flow of one or more other fluids to the dispensing nozzle for mixture with the carbonated liquid. The dispensing nozzle includes an adjustable diffuser having a plurality of members in spaced relation to define flow paths

therebetween. Means for maintaining a constant flow rate of carbonated liquid are located upstream of the diffuser. The diffuser is adjustable to provide a variable amount of dissolved carbon dioxide in the dispensed liquid while maintaining a substantially constant flow of liquid. The diffuser includes at least two relatively movable members which define a carbonization control gap therebetween and further includes a gradually increasing transverse area flow path for gradually exposing the carbonated liquid to atmospheric pressure. The carbonization control gap and the flow path cooperate to regulate the percentage of dissolved carbon dioxide in the dispensed liquid.



3,727,845

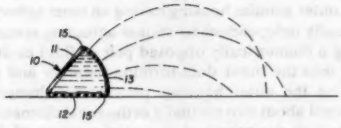
GARDEN SPRINKLER HOSE

Heino Bohlman, 35 Xavier St., Denver, Colo.

Filed Sept. 13, 1971, Ser. No. 179,905

Int. Cl. B05b *1/30*

U.S. Cl. 239—534 **1 Claim**



A garden sprinkler hose generally triangular in transverse cross section, comprising two firm relatively thick walls joined at one of their longitudinal edges, and a third relatively thin and flexible wall joined at its longitudinal edges to the two thicker walls, the third wall being provided with sprinkler holes. The hose is designed to rest on one of its thick walls. Water pressure in the hose causes the thin flexible wall to curve outwardly, the degree of curvature depending on the pressure in the hose, thereby to control and vary the area which receives water through the aperture in the flexible wall.

3,727,846

APPARATUS FOR SHREDDING AND DISPOSING OF CONSTRUCTION WASTE MATERIAL

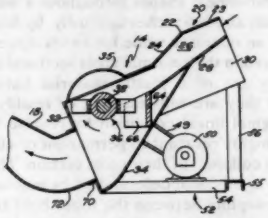
Jerome A. Rader, 900 Pennsylvania Avenue, Miami Beach, Fla.

Filed March 22, 1971, Ser. No. 126,794

Int. Cl. B02c *13/02, 13/288*

U.S. Cl. 241—47 **1 Claim**

Apparatus for disintegrating and disposing of bulk construction waste materials at a construction site, wherein the bulk material is fed into a shredding device for reducing the material to shredded particulate form, the shredded material thereafter being transferred by a vacuum-blower from the shredding device to a disposal area remote therefrom.



3,727,847

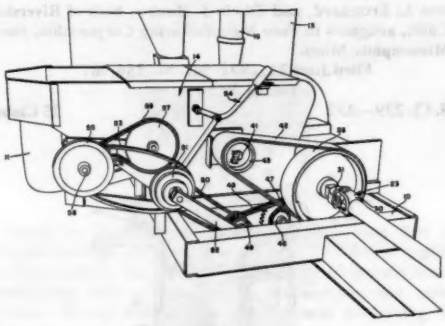
POWER SHAFT AND DRIVE FOR A FARM GRINDER-MIXER IMPLEMENT

Ivan Lloyd Nelson, Madrid, Iowa, assignor to Deere & Company, Moline, Ill.

Filed March 11, 1971, Ser. No. 123,251

Int. Cl. B02c *19/00*

U.S. Cl. 241—101 B **8 Claims**



A drive for a farm implement having a material-reducing unit and a material-blending unit composed of a driven power shaft with a rotary drive member fixed thereto for driving the blender and a second rotary drive member journaled to rotate on the shaft plus a coupler that is fixed to rotate with the shaft that is slidable axially along the shaft for coupling to the second rotary drive member. A drive extends from the second rotary drive member to the material-reducing unit for operating the latter.

3,727,848

HAMMER MILL WITH REPLACEABLE SPIDER ARM TIPS

Terry M. Francis, Davenport, Iowa, assignor to Sivger Steel Casting Company, Milwaukee, Wis.

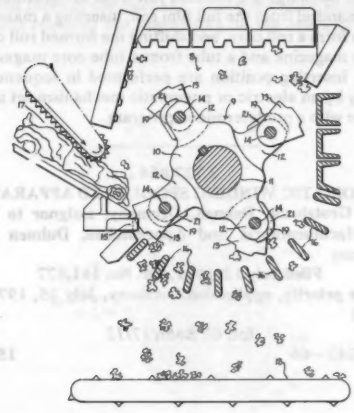
Filed Dec. 10, 1971, Ser. No. 206,631

Int. Cl. B02c *13/13, 13/26, 13/28*

U.S. Cl. 241—194 **10 Claims**

A hammer mill in which the outer end portions of the spider

arms between which the free swinging hammers are mounted, are protected against deleterious wear by replaceable caps or



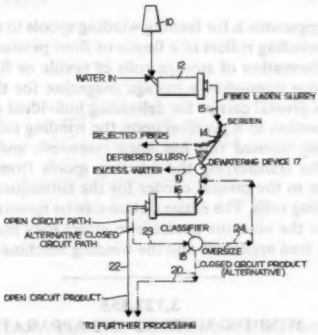
tips which are held in place by the insertion of a part thereof into a socket in the spider arm.

3,727,849

APPARATUS FOR AND METHOD OF LIBERATING AND REMOVING FIBROUS MATERIAL FROM A MINERAL ORE

David M. Kjos, Wauwatosa, and Chester A. Rowland, Jr., Shorewood, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 23, 1971, Ser. No. 201,433
Int. Cl. B27k *7/00*
U.S. Cl. 241—4 **31 Claims**



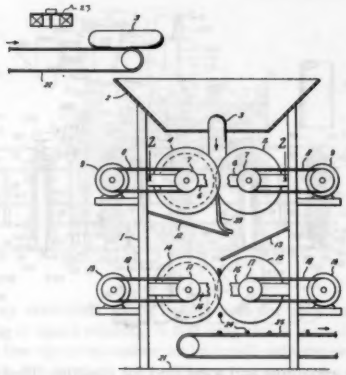
An apparatus for and a method of removing fibrous material from a mineral ore. In the described embodiment, the ore is first crushed in a suitable crushing apparatus to the proper feed size for a first grinding mill, normally a rod mill. The first grinding mill is so adjusted or designed as to grind the ore fed thereto to the coarsest grind at which most of the fibrous material is liberated from the rest of the ore. The fibrous material is a relatively coarse size when liberated at this grinding level. The ground material discharged from the first grinding mill is then fed as a slurry to a screening device having openings which are so sized as to retain on the screen as "oversize" the liberated fibrous material, but which pass the defibered slurry through the screen as "undersize." The defibered slurry is then passed to an additional grinding stage or stages in which the valuable or desired mineral is liberated to a desired degree from the defibered gangue material.

3,727,850

SCRAP RUBBER SHREDDING DEVICE

Clarence A. Krigbaum, 4621 Gasmer, Houston, Tex.

Filed April 16, 1971, Ser. No. 134,717
Int. Cl. B02c *18/06*
U.S. Cl. 241—159 **1 Claim**



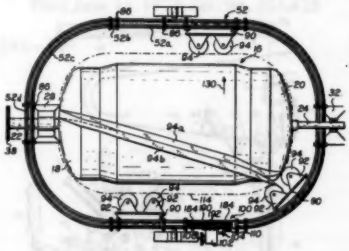
A device for shredding scrap, such as used tires, to reduce the scrap to small portions which may be readily and easily disposed of.

3,727,851

APPARATUS FOR WINDING INSULATION ONTO VESSELS

John J. Beninati, Kenilworth, N.J.; Paul P. Duron, Anaheim, Calif., and James L. Perry, Glen Ellyn, Ill., assignors to Airco, Inc., New York, N.Y.

Filed June 30, 1966, Ser. No. 561,833
Int. Cl. B65h *89/00*
U.S. Cl. 242—7.23 **14 Claims**



Thermal insulation is applied circumferentially to a vessel by rotating the vessel about its longitudinal axis to cover the cylindrical suraace with one layer per each revolution. A series of carriages are simultaneously driven about the vessel on a track inclined slightly to the horizontal axial plane of the vessel to wrap insulating tapes in a substantially longitudinal direction to provide interlocked layers of thermal insulation over both the end areas and intermediate surface.

3,727,852

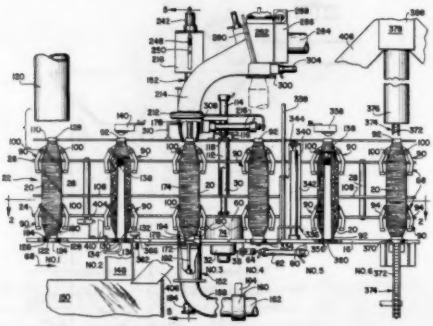
BOBBIN PROCESSING

John Nelson, North Kingstown, and William E. Stoppard, Warwick, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Continuation of Ser. No. 859,150, Sept. 18, 1969, abandoned. This application Oct. 4, 1971, Ser. No. 186,183

Int. Cl. B65h *54/00*

U.S. Cl. 242—35.6 R **35 Claims**



An apparatus and a method for readying filled supply bobbins for receipt by a winding machine. As each bobbin is delivered to the apparatus it is given a preliminary servicing and inspection, whereupon the bobbin is either rejected or further processed by having a tailing or inner end of the body of yarn severed and an unwinding or outer end of the yarn picked-up and formed into a bunch which is deposited by means of a ram in a hollow core of the bobbin for retention therein until subsequent retrieval at the winding machine. Next the bobbin is again inspected and either rejected or directed to the winding machine. The rejected bobbins may be deposited in a bin for manual inspection.

3,727,853

FILM WINDING MACHINE

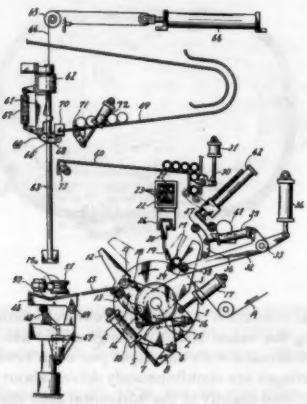
Hisashi Kinoshita, Moriguchi, Japan, assignor to Kabushiki Kaisha Fuji Tekkosho, Osaka, Japan

Filed Aug. 26, 1970, Ser. No. 67,027

Claims priority, application Japan, July 7, 1970, 59335/70

Int. Cl. B65h *19/26, 19/28*

U.S. Cl. 242—56 A **3 Claims**



A machine for winding film consecutively and automatically, by a predetermined length, on tubes without stopping the advance of the film which is continuously delivered from a film supply source to this machine, wherein all operations of film winding, film cutting, supplying a winding position with a roll core, discharging a full film roll from the machine, drawing out mandrel from the full film roll, inserting a mandrel into a tube to form a roll core, and shifting the formed roll core to a roll core magazine and a tube from a tube core magazine to a mandrel inserting position are performed in sequence automatically by an electric or pneumatic mechanism set up in accordance with a predetermined program.

3,727,854

AUTOMATIC WINDING SPOOL FEED APPARATUS

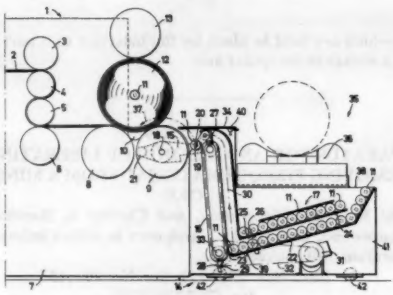
Oswald Grotzbach, Dalmen, Germany, assignor to Hergeth KG Machinenfabrik und Apparatebau, Dulmen (Westf), Germany

Filed July 12, 1971, Ser. No. 161,677

Claims priority, application Germany, July 25, 1970, P 20 37 006.3

Int. Cl. B65h *17/12*

U.S. Cl. 242—66 **15 Claims**



This apparatus is for feeding winding spools to a pair of side-by-side winding rollers of a fleece or fiber producing machine for the formation of storage rolls of textile or fiber material. The device comprises a storage magazine for the individual spools, a pivotal carrier for delivering individual spools from a ready position to a position upon the winding rollers after the previously formed roll has been removed, and a conveyor means for transferring the winding spools from the storage magazine to the pivotal carrier for the subsequent transfer to the winding rolls. The entire device can be mounted on wheels to render the machine portable to effect easy maintenance of both the feed apparatus and the winding machine.

3,727,855

WINDING METHOD AND APPARATUS

Hans H. Richter, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

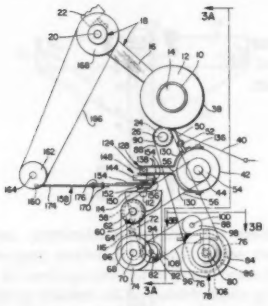
Filed April 5, 1971, Ser. No. 131,213

Int. Cl. B65h *54/38, 54/32*

U.S. Cl. 242—18.1 **8 Claims**

A method and apparatus for forming a wound yarn package on a winder having a rotary traverse cam and a cooperating follower yarn guide for traversing a strand of yarn as it is wound onto the package. The winder is equipped to synchronize ribbon breaking, scattering, and shortening of the traverse stroke of the yarn guide, for slowly or rapidly winding a cheese (or cone) shaped yarn package usually with tapered end faces so that the package is suitable for very rapid over-end unwinding within tolerable yarn breakage limits, as on a "shuttleless" loom. A package drive roll is operated at constant speed and the traverse cam speed is varied in the neighborhood of 10 to 30 percent or more to provide a form

of ribbon breaking and constantly varying high and low wind ratios. Scattering is provided at opposite end portions of the package for a length sufficient to avoid hard corners at the opposite end faces of the package. Traverse stroke shortening is not always required but, depending on the characteristics of



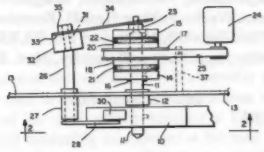
the yarn, is generally desirable for tapering the end faces to deter stitching. Stroke shortening and scattering are accomplished by axial shifting of the rotary traverse cam. The ribbon breaking and scattering features are synchronized so that the sharpest yarn reversals are provided at the end faces with broader reversals immediately inwardly of these faces.

3,727,856

TORQUE CONTROL METHOD AND APPARATUS

Paul E. Kitch, W. Springfield, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Filed April 26, 1971, Ser. No. 137,315
Int. Cl. B65h *25/04*, *25/28*
U.S. Cl. 242—75.5 **11 Claims**



A method and apparatus for controlling the amount of torque applied to a mandrel in response to a variable condition in which a variable force is obtained by flexing a flexible resilient member in an amount proportional to the variable condition which is sensed, the variable force being utilized to control the amount of torque applied to the mandrel.

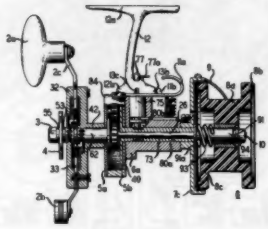
In a particular embodiment, the method and apparatus disclosed are employed in winding or unwinding a roll of material in which a variable force is obtained by flexing a flexible resilient member in an amount relating to the diameter of the roll of material being wound or unwound. The roll of material is sensed or monitored to detect changes in its diameter and the variable force generated in accordance with such detected changes is utilized to operate a force-actuated friction clutch for varying the amount of drive torque or braking torque transmitted either from a drive motor or from a brake to the roll of material being wound or unwound in response to the progress of the winding or unwinding, respectively.

3,727,857

CONVERTIBLE FISHING REEL

George B. Chann, 160 Church Street, Bridgeton, N.J.

Filed Sept. 28, 1971, Ser. No. 184,440
Int. Cl. A01k *89/02*, *89/04*
U.S. Cl. 242—84.2 B **11 Claims**



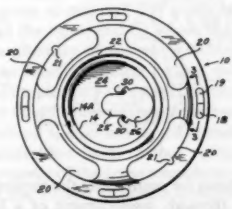
A two-way reversible spool fishing reel for spin casting, spool casting or spool winding. A star drag clutch provides for star drag or free spool operation; and a handle adjustment provides spool winding at two different speeds. A swivel mechanism connected to the shank of the rod support permits the position of the reel to be shifted with its axis parallel to the rod for spin casting, or normal to the rod at diametrically opposite positions for right-handed or left-handed spool casting or spool winding. A ratchet projections depending from the swivel mechanism locks against rotation of the shaft during spin casting, and presents a tapered face for ratchet action when the reel is shifted to right-handed or left-handed winding positions. The ratchet may be lifted to off position, or readily reversed to provide a noise maker. The crank handle is constructed with a slidable adjustment for keying a shift to high or low speed spool winding or free crank positions.

3,727,858

WIRE REEL

Richard D. Cornwell, and Darlene M. Cornwell, both of R. R. No. 1, Prior Lake, Minn.

Filed June 16, 1972, Ser. No. 263,423
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 **2 Claims**

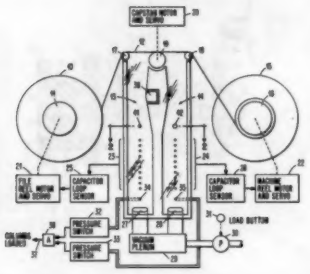


A reel for drawing off coiled spring wire comprises two mating and locking half drums. The coil is restrained internally. The wire end, brought out through an annular opening, is pulled as needed.

3,727,859
MEANS FOR EQUALIZING THE LOADING CHARACTERISTICS OF VACUUM COLUMNS

Robert P. Dobransky; Frederick B. Froehlich, both of Boulder; Bernard J. Halter, Longmont, and William H. Middleton, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 7, 1971, Ser. No. 150,321
Int. Cl. G11b *15/58, 23/12*
U.S. Cl. 242—182 12 Claims

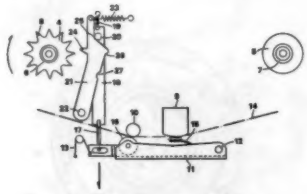


A magnetic tape unit having two vacuum column tape loop buffers, with a machine reel and a removable file reel disposed to selectively supply tape to or receive tape from one of the columns, and a single capstan located between the columns to control the tape movement. A tape processing station is mounted at a fixed position adjacent the upper portion of a narrow wall of the machine column. The lower portion of each column defines an operational zone and includes a capacitance-type loop position sensor whose output signal servo-controls the reel motors in accordance with the position of the tape loop bight within the zone. The upper portion of at least one of the columns includes air flow leakage means constructed and arranged to compensate for air leakage which occurs as the tape loop passes the processing station during loading of the tape loops into the columns, this controlled air leakage producing concurrent loading of the columns.

3,727,860
CONTROL ARRANGEMENT FOR TAPE RECORDERS

Osamu Okada, Tokyo, and Yuuji Mihori, Yokohama, both of Japan, assignors to Amerex Electronics Corp., New York, N.Y.

Filed Nov. 11, 1971, Ser. No. 197,784
Claims priority, application Japan, Nov. 12, 1970, 45/112410
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—208 10 Claims



An arrangement for controlling the modes of operation of a tape recorder through displacement of a lever carrying the pinch roller, to predetermined positions. The free end of the lever is linked to a slide member carrying the indexing pin designed to operate with three spaced indentations on a stop lever. The stop lever has a projection which is brought into the path of motion of a sprocket-shaped rotary member which supports a magnetic tape reel, when the tape recorder is actuated so as to be in the stop position.

3,727,861
METHOD AND APPARATUS FOR SUPPRESSION OF ANTIAIRCRAFT FIRE

Edwin G. Swann, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

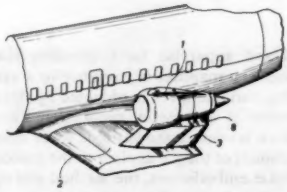
Filed March 5, 1970, Ser. No. 22,101
Int. Cl. F41g *7/00*
U.S. Cl. 244—3.15 4 Claims

An aerial weapon is provided for the suppression of antiaircraft artillery fire against an air attack. This concept has been called various names in the past, notably AFIRM standing for Anti-Flak InfraRed Missile. A first rocket delivers the missile which descends on a parachute until the heat of an antiaircraft gun is sensed. A second rocket propels the missile to target under control of heat sensing guidance and control unit.

3,727,862
AIRCRAFT POWER-UNIT SUSPENSION SYSTEM

Norbert Kaufhold, Bremen-Burg; Klaus Konig, Lilienthal; Heinrich Keller, Bremen, all of Germany; Jan G. de Graaf, Zwanenburg, Netherlands; Jan Johan Blankenzee; Hans Bakker, both of Amstelveen, Netherlands, and Carolus Plettenburg, Risjsenhout, Netherlands, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Nov. 30, 1970, Ser. No. 93,737
Claims priority, application Germany, Nov. 29, 1969, P 19 60 005.6
Int. Cl. B64b *1/24*
U.S. Cl. 244—54 5 Claims



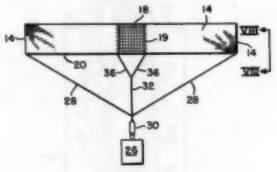
A suspension system for an aircraft power unit having a spacer member mounted on the structure of the airframe. Means are provided for mounting the power unit to the spacer member so as to permit the power unit to vibrate predominantly in one predetermined direction and avoid resonance between the power unit and the airframe structure. The mounting means includes an elastic member such as a torsion bar arranged between and connected to the spacer member and the power unit.

3,727,863

AIR-VENTING PARACHUTE

Victor G. Bockelmann, El Centro, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 23, 1971, Ser. No. 155,929
Int. Cl. B64d *17/12*
U.S. Cl. 244—145 **9 Claims**



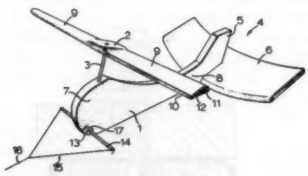
A parachute, particularly suitable for decelerating illuminating flare-type payloads, in which the canopy is constructed with an arrangement of high air permeable areas for venting the rising column of hot combustion gases from said flare and thereby slow the descent to increase flare performance.

3,727,864

HELICOPTER KITE

Walter P. Tolomizenko, 240 Ellis Avenue, Toronto, Ontario, Canada

Filed Feb. 8, 1971, Ser. No. 113,451
Int. Cl. B64c *31/06*
U.S. Cl. 244—154 **6 Claims**



The invention relates to a kite which simulates a helicopter and includes a body which has a rotor mounted on an axle above the front end thereof and a tail assembly at the rear end thereof. The rotor is of the type which rotates when acted on by a stream of air and which creates a lifting effect as it rotates. The tail assembly comprises a fin and a stabilizer of relatively large lateral extent. This large stabilizer serves to maintain the kite and the plane of the rotor in the desired attitude for stable flight and further serves to counter any tendency of the kite to drift or tilt to one side.

ERRATUM

For Class 246—182 see:
Patent No. 3,728,539

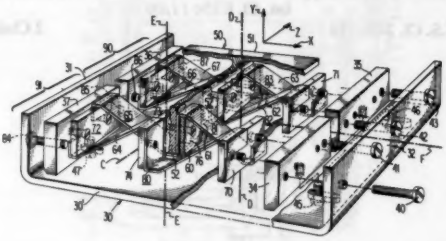
3,727,865

SUSPENSION SYSTEM

David Robert Melrose, and Derek Sidney Binge, both of Hamilton Square, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 9, 1970, Ser. No. 79,496
Int. Cl. F16l *15/04*
U.S. Cl. 248—15 **28 Claims**

A rigid member having six degrees of freedom in a system in which the member is suspended from a support by a plurality of webs (preferably four or more) arranged to develop restoring stresses in the webs in response to any disturbing force or torque to restore the member to its equilibrium position. The properties of the webs may be selected to provide a wide range of system spring stiffness for use in an environment of significantly improved thermal isolation.

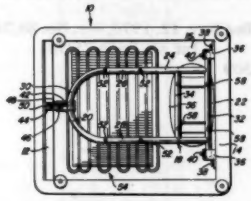


3,727,866

REPLACEMENT REFRIGERATOR COMPRESSOR BRACKET

Curry A. Drake, 2411 Baxter Street, Mobile, Ala.

Filed June 25, 1971, Ser. No. 156,794
U.S. Cl. 248—16 **11 Claims**



A horizontally elongated support frame including a single center mounting point at one end and a pair of opposite side mounting points at the other end by which the frame may be supported from a plurality of makes of refrigerators and/or freezers, the frame itself including further mounting means adapted to support a plurality of motor/compressor and condenser assemblies of different makes therefrom whereby the frame may be utilized to support specific motor/compressor and condenser assemblies from various refrigerators and/or freezers, not necessarily of the same manufacturer.

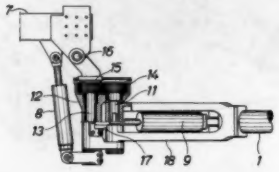
The bracket of the instant invention comprises a frame for mounting beneath a refrigerator or freezer and includes structure by which the step of mounting the frame from the refrigerator or freezer may be readily carried out with little effort on many different refrigerators and freezers of different manufacturers. Also, each of the three forms of support frame specifically disclosed hereinafter include structure by which motor/compressor and condenser assemblies of various manufactures may be supported therefrom.

3,727,867

DEVICE FOR TURNING THE FEED DEVICE FOR A ROCK DRILL

Ilmari Toppila, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed June 28, 1971, Ser. No. 157,429
Claims priority, application Finland, June 29, 1970, 1818/70
Int. Cl. E21c *11/00*
U.S. Cl. 248—16 2 Claims



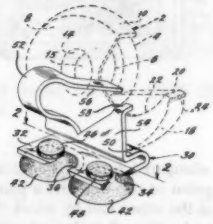
The present invention concerns a device for turning the feed device of a rock drill with references to the guiding jib around a transversal, fixed, horizontal shaft by the aid of a power cylinder. The invention is characterized in that the feed device has been connected to a turning shaft running parallel to the said fixed shaft and journalled in a turning head turnably carried on the fixed shaft, which shafts have been connected with each other, most appropriately with the aid of gears, and that a power cylinder has been connected between the guiding jib and the turning head.

3,727,868

HOLDER FOR TAPE DISPENSERS

Dwight D. Buchanan, 503 North Crescent Drive, Kirkwood, Mo.

Filed Nov. 12, 1970, Ser. No. 88,744
Int. Cl. B65h *75/36*
U.S. Cl. 248—309 17 Claims



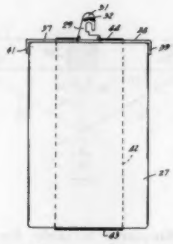
A holder for a tape dispenser includes a base which is engaged with suction cups for securing the base and holder to a supporting surface. In one embodiment the base supports a dispenser seat which in turn has a retaining arm projecting outwardly from it and then doubling back over the seat. The retaining arm fits through a hollow spindle on the dispenser and holds the dispenser against the seat. In other embodiments the base also supports a dispenser seat, and the seat has a pair of walls extending upwardly from it. The dispenser is clamped between the walls. Thus tape can be withdrawn from the dispensers with only one hand. In every embodiment the base is detachable from the suction cups to facilitate installation of the dispenser in the holder.

3,727,869

HOOK AND ACTUATOR FOR VENDING MACHINE

Charles H. Flubacker, 524 South Harvard Avenue, Arlington Heights, Ill.

Filed May 17, 1971, Ser. No. 143,923
Int. Cl. B65d *63/18*
U.S. Cl. 248—339 6 Claims



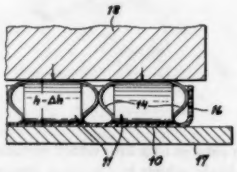
An improved merchandise supporting hook and release mechanism actuator for a vending machine for supporting merchandise in the vending machine and releasing it such that only a single article will be dispensed by the release mechanism during each duration.

3,727,870

RESILIENT SUPPORT

Rudi Bass, 98 Riverside Drive, New York, N.Y.

Filed May 10, 1971, Ser. No. 141,738
Int. Cl. A47g *29/00*
U.S. Cl. 248—350 9 Claims



A base of resilient (polymeric or metallic) sheet material carries a multiplicity of cup-shaped projections of polygonal outline formed in one piece therewith, each projection having a generally prismatic shape with slits along their longitudinal edges enabling individual deformation of its several sides under pressure acting upon the bottom of the cup. The coplanar cup bottoms may support a load parallel to the base or may collectively act as a bumper or shock absorber. The mutual separation of the undeformed projections is substantially less than their height so that, in response to a predetermined loading stress, their outwardly bulging sides contact one another and prevent further depression of the cup bottoms toward the base.

3,727,871

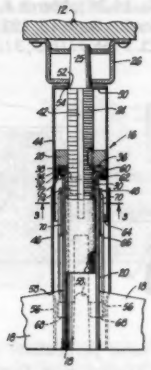
SEAT-HEIGHT ADJUSTMENT DEVICE

Henry J. Harper, 720 Greentree, Pacific Palisades, Calif.

Filed April 14, 1972, Ser. No. 243,959
Int. Cl. F16m *11/00*, *13/00*
U.S. Cl. 248—406 6 Claims

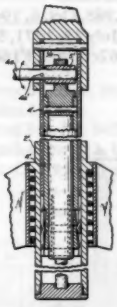
A seat-height adjustment device for a swivel chair including a clutch and upper and lower telescoping tubes. The tubes

receive and cover the threaded spindle, hollow post, and bell nut of the chair. The clutch means is actuated by upward



movement of the lower tube to releasably lock the bell nut for axial movement relative to the spindle upon a turning of the seat of the chair.

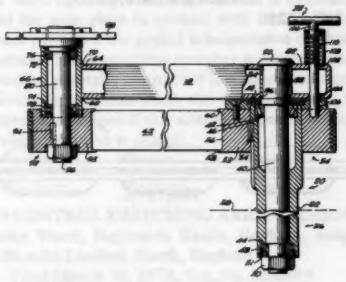
3,727,872
COLUMN OF AN OFFICE CHAIR
Albert Spieth, Baumrente 15, Oberesslingen, and Rudolf Spieth, Haus 14, Esslingen-Oberhof, both of Germany
Filed June 15, 1970, Ser. No. 45,950
Int. Cl. F16m *11/00*
U.S. Cl. 248—412 **3 Claims**



A releasable lock of a tube telescope, variable as to its length, as a column of an office chair, which comprises a cone, and a column tube movable as to its height and having a longitudinal slot at its free lower end. Tongues are supported by the column tube and the cone is pressed in the locking position against the inner face of the tongues. The latter carry a nose member pointing towards the cone, whereby the line of the convex surface of the cone converges in the direction towards a seat of the chair.

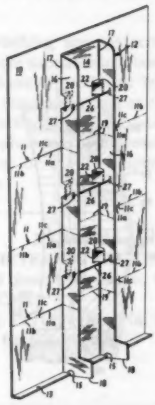
3,727,873
ADJUSTABLE CRANE SEAT
John H. Hill, 6255 S.W. 98th Street, Miami, Fla.
Filed July 19, 1971, Ser. No. 163,968
Int. Cl. F16m *11/08*
U.S. Cl. 248—418 **6 Claims**

A vehicle and equipment seat support to allow one operator to efficiently operate the carrying vehicle and any mounted equipment where the controls of the mounted equipment are remotely mounted on the vehicle at a station different from that at which the vehicle controls are located, said combination including a first main seat support, a swingable arm with the seat rotatably journalled on the end of the arm, and belt means interconnecting the seat and the main support stan-



dard, so that when the swingable arm is rotated, it will travel through an arc about the main seat support and, simultaneously, the seat will be rotated relative to an axis through the main seat support.

3,727,874
FOLDING PANEL CONSTRUCTION
John H. Wuensch, Leonia, N.J., assignor to Electronic Assistance Corporation, Fair Lawn, N.J.
Filed Sept. 17, 1971, Ser. No. 181,368
Int. Cl. A47f *5/11*
U.S. Cl. 248—459 **13 Claims**



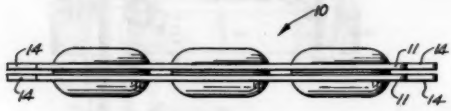
A self-erecting foldable display structure has a continuous display panel supported by a collapsible frame secured to its reverse side. The support frame includes an elongated back panel and a pair of side panels integrally hinged to the respective longitudinal edges of the back panel. Transverse fold lines are formed in both the support frame and the display panel dividing the structure into a plurality of sections. A combination of flaps and elastic bands in the support frame tend to maintain the frame with a U-shaped cross-section, thereby preventing folding of the structure. Manual flattening of the side panels against the pull of the elastic bands permits the structure to be folded along the transverse fold lines into a substantially flat, compact package. When the folded structure is held at its upper end and allowed to unfold freely, the support frame automatically reassumes its U-shaped configuration and supports the display panel in a substantially vertical position.

3,727,875

GREASELESS BAKED DONUT MOLD

John D. Downing, 3218 Jennings Street, Sioux City, Iowa

Filed May 7, 1971, Ser. No. 141,200
Int. Cl. B29c 1/00
U.S. Cl. 249—121 1 Claim



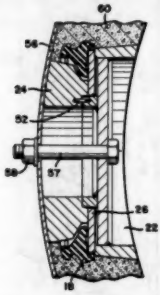
A device for producing donuts. This device includes a pair of members having a multiple number of depressions which when filled with the proper ingredients and placed matingly together and placed in an oven at the proper temperature, will produce donuts.

3,727,876

CORE DEVICE FOR VOID FORMING AND GASKET SUPPORT IN A MOLD WALL

Lewis R. Keyser, Dayton, Ohio, assignor to Price Brothers Company, Dayton, Ohio

Filed Nov. 22, 1973, Ser. No. 200,972
Int. Cl. B28b 7/28
U.S. Cl. 249—184 13 Claims



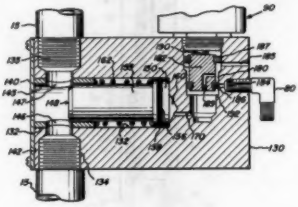
Method and apparatus for forming a void through the wall of a pipe during the casting process and supporting a gasket for embedment in the pipe about the void. The apparatus is made in three pieces, including an outer, contoured mold member which engages the pipe form and supports the gasket by engaging one of the faces, a ring shaped sustaining plate which engages an inner edge of the gasket in an interference fit, and an inner mold member which is also contoured, and in conjunction with the outer mold member, defines the void through the wall of the pipe. The inner and outer mold members, which are relatively expensive, can be stripped from the freshly cast concrete pipe at the same time the pipe form is removed and reused in another casting operation, while the relatively inexpensive sustaining ring is retained in the freshly cast pipe to support the gasket and maintain it round until the concrete has cured to sufficient strength to allow the sustaining ring to be removed.

3,727,877

PILOTED SHUT-OFF VALVE

Luis Beguiristain, St. Paul, Minn., assignor to Chayes Dental Instrument Corporation, Danbury, Conn.

Division of Ser. No. 16,381, March 4, 1970, Pat. No. 3,636,974. This application Sept. 15, 1971, Ser. No. 180,568
Int. Cl. F16k 31/143, 31/42
U.S. Cl. 251—30 6 Claims



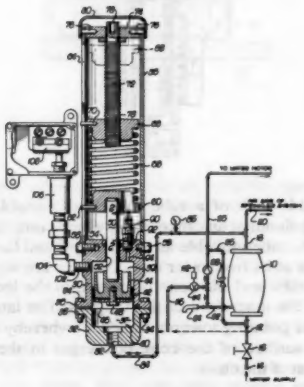
A piloted shut-off valve particularly adapted for use in evacuator systems to control flow from a single vacuum source. The shut-off valve includes a valve body having a bore therethrough with a piston controlling flow between ports in the body, the piston defining with the bore a pilot chamber in which a three-way piloted valve controls the position of the piston and with the three-way valve being controlled from an electric source. The valve will operate in any position of the valve body irrespective of the force of gravity.

3,727,878

QUICK OPENING DEVICE FOR DRY-PIPE VALVES OF AUTOMATIC SPRINKLER SYSTEMS

Charles F. Willms, Rutherford, N.J., assignor to Norris Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 863,985, Oct. 6, 1969, Pat. No. 3,616,860. This application July 15, 1971, Ser. No. 162,958
Int. Cl. A62c 37/06; F16k 31/145
U.S. Cl. 251—57 1 Claim



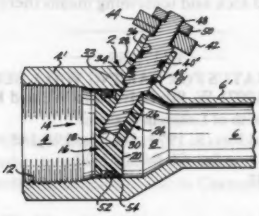
A component for automatic sprinkler systems employed for fire protection is provided which is useful in dry-pipe systems to cause rapid opening of the dry-pipe valve of such systems in response to a slight but rapid decrease of air pressure in the sprinkler piping network attendant upon opening of a sprinkler head. Slow decreases in such pressure in relation to atmospheric pressure are off-set by an atmospheric bleed valve, a readily accessible adjustment for altering and visibly indicating the trip-off pressure is provided, and provision is made for either electrical or pneumatic operation.

3,727,879

SHUT-OFF VALVE

Peter J. Lange, and Harcourt G. Runnings, both of Seattle, Wash., assignors to Red Dot Corporation, Seattle, Wash.

Filed Dec. 4, 1970, Ser. No. 95,249
Int. Cl. F16k *1/226*
U.S. Cl. 251—84 **10 Claims**



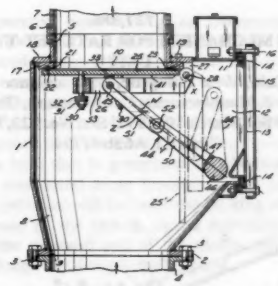
A shut-off valve is disclosed wherein the flow is put through a cylindrical passage controlled by valve means including a truncated spheroidal closure member which is pivotally mounted in the passage to swing about an axis intersecting the cylindrical axis of the passage at an acute angle thereto, and normally centered at the intersection of the aforesaid axes. The member is separated at its periphery from the wall of the passage by a clearance in a diametral plane thereof which traverses the full circumference of the member; and there is a pressure deformable O-ring relatively slidably engaged on the periphery of the member in the clearance, which is adapted to compressibly interengage between the wall of the passage and the periphery of the member in the closure position of the member. There are also means operative to retain the O-ring on the periphery of the member as the member is swung into and out of the closure position thereof.

3,727,880

VALVE

Arthur J. Stock, Lakewood, Ohio, assignor to Stock Equipment Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 847,380, Aug. 4, 1969, abandoned. This application Dec. 22, 1970, Ser. No. 100,588
Int. Cl. F16k *25/00*
U.S. Cl. 251—85 **13 Claims**



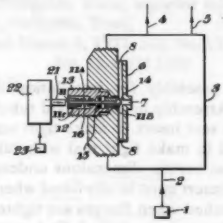
A valve for controlling flow to a burner of pulverized coal and air mixture in which valve has a body with an opening surrounded by an auxiliary metal valve seat portion and an annular sealing gasket formed of resilient material such as natural or synthetic rubber that can deteriorate under extraordinary conditions such as heat or explosion. A generally flat gate plate positioned within the valve body is mounted on a movable supporting member so it can be moved from an open position to a closed position in which it contacts the gasket or the auxiliary seat portion to seal the valve opening. The gate plate is movably mounted on the supporting member so it can tilt, within limits, relative to the supporting member to reduce scuffing of the gasket on opening or closing of the valve, and so it is resiliently urged away from the supporting member toward the valve opening when the member is in closed position to hold the gate plate in contact with the gasket or with the metal seat portion if the gasket is inoperative or absent due to deterioration. The supporting member is pivotally mounted and is moved by pivotally connected link members that are in an over-the-center position when the valve is closed, to hold the gate plate closed even if the actuating means becomes inoperative when the valve is closed.

3,727,881

FLUID CONTROL SWITCHING ARRANGEMENTS

Edward John Ward, Haywards Heath, England, assignor to Norcon (Norris) Limited, Heath, England

Filed March 29, 1971, Ser. No. 128,985
Claims priority, application Great Britain, Dec. 12, 1970, 59,173/70
Int. Cl. F16k *1/14, 31/02*
U.S. Cl. 251—129 **7 Claims**



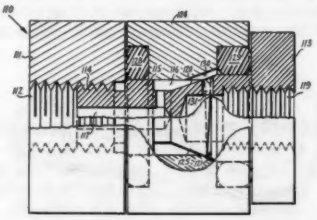
A fluid control switching arrangement having a control valve employing a needle slideable in a bore to close an outlet, wherein the friction losses introduced by a sealing ring are reduced by providing the sealing ring at a relatively thin central portion of the needle, between relatively thick end portions. The control valve may be pressure operated by a diaphragm or bellows, or may be operated by a electromechanical transducer.

3,727,882

METERING VALVE

Glenn A. Burris, and Joseph P. Lares, both of 967 Center Street, San Carlos, Calif.

Filed Aug. 19, 1971, Ser. No. 173,035
Int. Cl. F16k *5/10*
U.S. Cl. 251—209 **1 Claim**



The present invention relates to a metering valve in which a valve plug has an annular groove tapering from zero width to a full width with the groove communicating with a port in a rotatable valve seat member. The relative position of the groove with respect to the port determines the size of the opening through which fluid is to pass to permit any desired degree of metering from 0 to 100 percent.

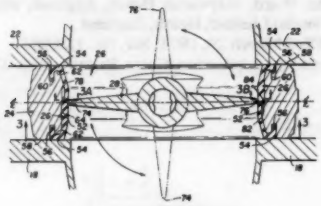
The valve plug is semi-spherical in the preferred form of the invention and is conical in a modified form of the invention. In another modified form of the invention the valve seat member is provided with a scale to indicate the relative position of the valve.

3,727,883

BUTTERFLY VALVE

John A. Conners, Fairfield; Donald W. Liepelt, Madison, and William H. Baulieu, Monroe, all of Conn., assignors to Jenkins Bros., Bridgeport, Conn.

Filed Jan. 26, 1972, Ser. No. 220,958
Int. Cl. F16k *1/22*
U.S. Cl. 251—306 **5 Claims**



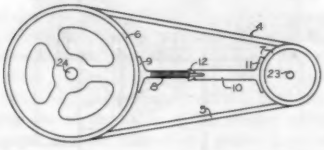
Butterfly valve assembly for installation in a pipe line between flanges. Assembly includes rigid tubular valve body and resilient valve seat insert to make tight seal with flanges when installed and to make tight seal with valve disc in service. Seat insert has certain dimensions undersize relative to valve body so that insert must be stretched when fitted to body and is further stretched when flanges are tightened during installation. Stretching assures secure fit between insert and body before installation and leak proof seal after installation. Seat insert and valve body have cooperating radial ledges asymmetrically located to prevent relative movement when valve disc is closed. Insert has annular flange sealing portions each with an inturned bead which enters an annular groove formed in the valve body. Flange sealing portions are so shaped that when valve is installed between flanges of a pipe line the beads are forced into but do not fill the grooves thus reducing tendency toward squeezing excess resilient material into, and consequent loosening of, the portion of the insert in which the disc must seat.

3,727,884

V-BELT TENSIONING MEANS

Harry Willis Custer, 30635 Helmandale Drive, Franklin, Mich.

Filed July 30, 1971, Ser. No. 167,632
Int. Cl. B66f *3/08*
U.S. Cl. 254—67 **1 Claim**



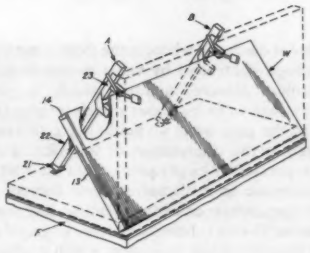
Improvement in a V-belt tensioning means for tensioning a V-belt operative in respect to a pair of sheaves is disclosed said V-belt tensioning means comprising jack means constructed to be disposed and to be axially operative between said sheaves, said jack means having identical outer ends constructed to engage said sheaves, respectively, said jack means having screw thread means operative to change the length of said tensioning means so as to apply a tensioning force to spread said sheaves apart to tension said V-belt, said improvement comprising said identical outer ends constructed to engage the walls of the V-grooves of said sheaves by each said end comprising a pair of spaced apart cylindrical legs disposed in the same plane and at an obtuse included angle with respect to each other so that when said tensioning means is disposed and made to be axially operative between said sheaves the walls of the V-grooves thereof are engaged by said cylindrical legs to center and lock said tensioning means therebetween.

3,727,885

LIFT APPARATUS FOR RAISING WALL SECTIONS

Kenneth Jones, 10071 W. 9th Drive, and Willard E. Patterson, 1250 Lee St., both of Lakewood, Colo.

Filed Nov. 5, 1971, Ser. No. 196,145
Int. Cl. B66f *13/00*
U.S. Cl. 254—133 **12 Claims**



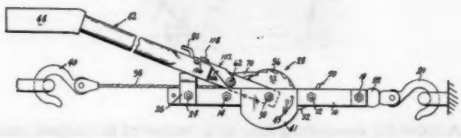
Lift apparatus for raising wall sections from a prone position to an upright position comprises at least one lift assembly including a socket-like pivotal base, an upright support having the lower end releasably inserted into the pivotal base adapted to pivot with the base as the wall section is raised, and a movable lift member slidable up the upright support adapted to receive an upper end portion of the wall section and raise with the wall section as lifting forces are applied to the wall section and automatically latch against downward movement as the lifting forces are removed. For raising longer wall sections two or more similar lift assemblies are located at spaced intervals along the wall section and alternately raised in incremental distances until the wall section is upright.

3,727,886

RELEASE MECHANISM FOR RATCHET-TYPE POWER UNIT

Robert L. Cain, West Lafayette, Ind., assignor to The American Gage & Manufacturing Co., Wauseon, Ohio

Filed March 10, 1971, Ser. No. 122,755
Int. Cl. A63b *61/04*
U.S. Cl. 254—164 **10 Claims**



Release mechanism for a ratchet-type power unit utilizing a ratchet drum upon which a flexible tension member is wound. Rotation of the drum is produced by oscillation of a lever arm having a ratchet catch pivotally mounted thereon. The release mechanism of the invention permits pivoting of the catch between a drum engaging ratcheting position, and an untensioning or "let down" position where the catch clears the

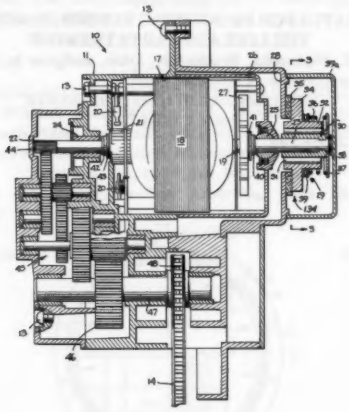
ratchet teeth of the drum. The catch includes a torsion spring exerting a constant biasing force thereon about the catch pivot, and a leaf spring mounted on the catch is selectively engageable with a movable spring compressor which selectively permits the leaf spring to overcome the torsion spring bearing force. The spring compressor is mounted upon a slidable carriage for accessible manual operation and positioning, and the catch includes a manually operable portion disposed adjacent the spring compressor carriage.

3,727,887

POWER HOIST WITH LOAD BRAKE

George F. Lytle, deceased, late of St. Louis, Mo. (by Clara A. Lytle, executrix), assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 31, 1972, Ser. No. 222,068
Int. Cl. B66d *1/00*
U.S. Cl. 254—168 8 Claims



A power operated hoist having an overrunning clutch mounted on an extended end portion on the shaft of the hoist motor, and a simple brake that is constantly engaged between the clutch and a wall on the hoist frame so that the frame will accept directly the low amount of torque that is necessary to support a load on the load shaft of the hoist. Torque that is added by an operation of the motor will effect lowering of the load, while the heat that is generated by slip friction of the brake will be conducted away through a wall of the hoist frame. Lifting operation will be free from braking effect due to automatic release by the clutch. Speed reduction gears are connected to the opposed end of the motor shaft, being of rather simple design involving no brake parts.

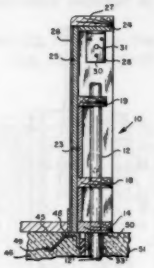
3,727,888

HOCKEY RINK BOARD

Arthur J. Nickolas, Mequon, Wis., assignor to Ice Crafts, Inc., Mequon, Wis.

Filed Sept. 4, 1970, Ser. No. 69,663
Int. Cl. E04h *17/16*
U.S. Cl. 256—24 9 Claims

Panel sections stand end to end to form a wall around a hockey rink or the like. Each panel has a central post for holding it upright and for pivoting it into alignment with similar panels to form a wall. The end of each panel has means for interlocking with an adjacent panel so as to secure it against



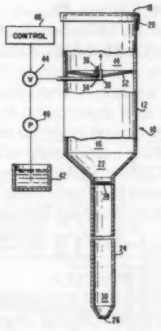
rotation and to keep it in alignment with others so they present a smooth surface to the hockey rink side of the wall.

3,727,889

MIXING METHOD AND APPARATUS

Fritz J. Nagel, Memphis, Tenn., assignor to Chapman Chemical Company, Memphis, Tenn.

Filed March 8, 1971, Ser. No. 122,006
Int. Cl. B01f *5/00*
U.S. Cl. 259—1 R 20 Claims



A measured amount of diluent fluid is directed in a stream into a container of a chemical substance so as to wash the chemical substance from the container while accomplishing a dilution and mixing of the chemical substance with the diluent fluid.

3,727,890

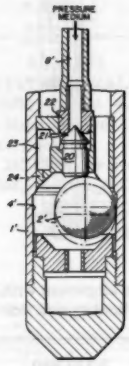
VIBRATOR FOR, AND METHOD OF COMPACTING CONCRETE AND SIMILAR MASSES

Franc Seidl, and Philipp Uebel, both of Munich, Germany, assignors to Wacker Werke KG, Munich, Germany

Filed Oct. 13, 1971, Ser. No. 188,905
Claims priority, application Germany, Oct. 14, 1970, P 20 50 364.4
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 R 25 Claims

A vibrator for, and a method for, compacting concrete and the like material in which the vibrator has a housing and an eccentric mass therein, a fluid supply leads into the chamber in which the mass is located for actuating the mass by fluid pressure and an exhaust leads from the chamber. The rate of

supply of fluid to the chamber is regulated by a control sensitive to the amplitude of movement of the eccentric mass so that when the vibrator is engaged with the material to be compacted there is maximum fluid flow to the chamber and when the vibrator is disengaged from the material, the supply of fluid to the chamber is reduced.



3,727,891

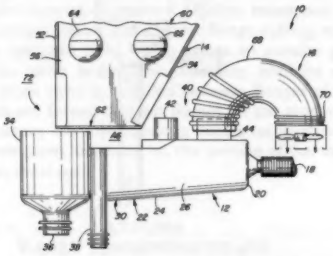
APPARATUS AND METHOD FOR MIXING PARTICULATE INGREDIENTS WITH A LIQUID

Frank David Brill, Norridge, Ill., assignor to The Seeburg Corporation of Delaware, Chicago, Ill.

Filed Oct. 29, 1970, Ser. No. 85,144

Int. Cl. B01f *5/00, 15/02*

U.S. Cl. 259—4 **19 Claims**



In a system wherein particulate ingredients are added to a liquid through an outlet of a dispenser positioned above the liquid, an air flow is created to cause particles of the ingredients in the vicinity of the outlet of the particulate ingredient dispenser to be passed adjacent to the surface of the liquid and then to be extracted from the system. Mixture of the particulate ingredients and the liquid may be enhanced by forcing the air flow to pass either in close proximity to or through a curtain of the liquid.

3,727,892

FEEDBACK CONTROL FOR A CONTINUOUS MIXER HAVING A CONTROL OF INTERNAL PRESSURE

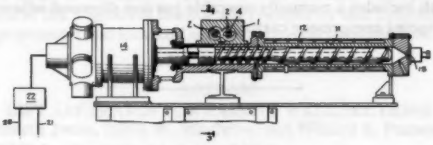
Angelo Joseph Notte; Peter Hold, both of Milford, and Klaus Juergen Spitzner, Oxford, all of Conn., assignors to USM Corporation, Boston, Mass.

Filed Dec. 14, 1971, Ser. No. 207,743

Int. Cl. B01f *7/02*

U.S. Cl. 259—10 **2 Claims**

This disclosure is directed toward an electromechanical feedback control for automatically regulating the discharge temperature in a continuous mixer. The feedback control senses both the mixer discharge temperature and the rate of change of mixer rotor torque. The torque rate of change is detected by a derivative circuit and serves to offer an anticipatory signal to the control system. The feedback control then regulates the internal pressure of the mixer in accordance with an error signal representing the difference between the measured mixer discharge temperature plus torque derivative signals and a preset desired temperature command signal.



3,727,893

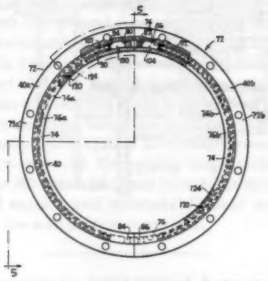
APPARATUS FOR PROCESSING RUBBER, PLASTIC AND THE LIKE AND PARTS THEREOF

James T. Matsuoka, Brecksville, Ohio, assignor to Intercole Automation, Inc., Cleveland, Ohio

Filed July 19, 1971, Ser. No. 163,918

Int. Cl. B01f *7/02*

U.S. Cl. 259—109 **4 Claims**



Apparatus for processing rubbers, plastics, other elastomers, and the like, including a rotatable material processing member having a processing portion within a material processing chamber and supporting shaft portions extending through end walls of the chamber and a seal having a water-cooled wear ring for preventing the leakage of material from the mixing chamber around the shaft portions of the rotors extending through the end walls of the mixing chamber.

3,727,894

APPARATUS FOR MOISTENING MIXABLE MATERIALS

Kurt Ahrenberg, Huettenweg 5, Herborn, Germany

Filed Nov. 13, 1969, Ser. No. 876,461

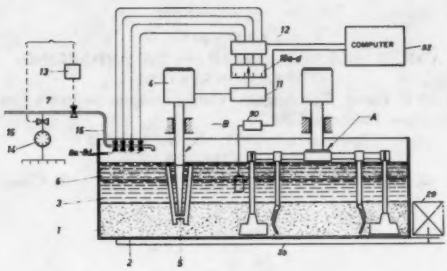
Claims priority, application Germany, Nov. 15, 1968, P 18 08 998.0

Int. Cl. B28c *7/04*

U.S. Cl. 259—154 **14 Claims**

The invention relates to methods of controlling the moistening of mixable materials and to apparatus for carrying out the methods. The invention is particularly applicable to the moistening of foundry casting sand with water. In one method of high-speed low-inertia auxiliary mixing tool is rotated in the

sand and the quantity of water added is determined in dependence on the resistance of the sand to rotation of the tool as



measured by the power consumption of an electric motor driving the tool. Also disclosed is apparatus for carrying out the method automatically.

3,727,895

COOLING COATED WIRES, STRIPS AND THE LIKE

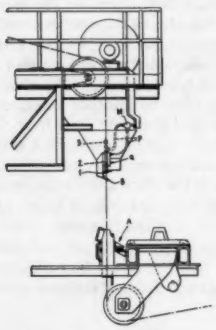
Herman William John Wondergem, Birmingham Gardens, New South Wales, Australia, assignor to Australian Wire Industries Proprietary Limited, Melbourne, Victoria, Australia

Filed June 26, 1970, Ser. No. 50,086

Claims priority, application Australia, June 26, 1969, 57082/69

Int. Cl. C21d *9/52*

U.S. Cl. 266—3 R **6 Claims**



An apparatus for cooling a coating on a wire comprising three separate coaxial passages through which the wire is adapted to pass after coating, the first and second passages passing through the walls of a pressurized gas manifold, the third passage having a tangentially directed liquid inlet bore therein and being flared at its lower end to define a liquid outlet passage between its lower end and the upper end of said second passage, means supplying liquid to said bore at such a rate as to cause a steady helical flow of liquid which fills said third passage but flows primarily from said outlet passage, and means supplying gas to said manifold at a pressure sufficient to cause substantially all of said quenching liquid to flow through said outlet passage.

3,727,896

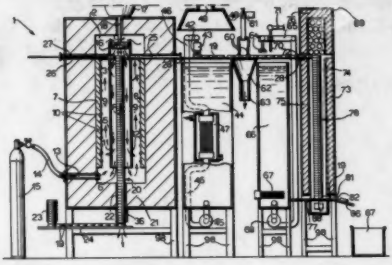
HEAT TREATMENT APPARATUS

Georg Claesson, Gladwyne, Pa., and Renato Battini, Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Nov. 22, 1971, Ser. No. 200,940

Int. Cl. C21d *9/40*

U.S. Cl. 266—4 R **20 Claims**



Apparatus for the heat treatment of annular metal components such as rings for rolling element bearings is disclosed. The apparatus is designed to be automatic and to take up less space in a factory production line. This is achieved by providing a tempering furnace and an annealing furnace each with at least one substantially vertical conduit through which a stack of the components can be transported in the axial direction of the stack. The conduits are arranged to be slightly larger than the diameter of the component being treated and there are provided means for creating a flow of heat exchange fluid through each furnace respectively, the flow of heat exchange fluid being in a direction opposite the direction of movement of the components. This allows each component to go through exactly the same temperature changes for exactly the same length of time as each other which is an advantage over previous systems in which the rings have been treated in irregular orientations where the temperature gradients within a furnace result in each component being raised to a slightly different temperature for different lengths of time resulting in a lack of uniformity in the eventual hardness of different finished components.

3,727,897

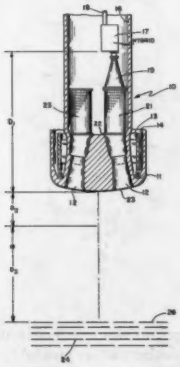
LANCE WITH DISTANCE MEASURING SUB-SYSTEM

Robert George Bennett, Lowell, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Filed Feb. 17, 1971, Ser. No. 116,075

Int. Cl. C21c *7/00;* **G01s** *9/04*

U.S. Cl. 266—34 LM **6 Claims**



The invention is directed to an assembly which includes in combination a lance for supplying a gas to a nozzle in com-

bination with radar-type means for determining the distance between the nozzle and a reflecting surface spaced from the nozzle. In the preferred embodiment, the assembly comprises an oxygen lance for a basic oxygen furnace which includes means for determining the distance between the lance and the surface of the charge in the furnace.

3,727,898

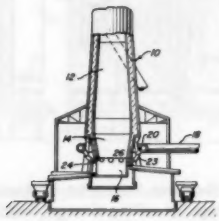
FABRICATED TUYERE NOZZLE

John E. Allen, 606 Timber Lane, Lake Forest, Ill.

Filed Feb. 22, 1971, Ser. No. 117,350

Int. Cl. C21b 7/16

U.S. Cl. 266—41 **9 Claims**



A tuyere nozzle for a metallurgical furnace fabricated from a plurality of functional elements joined together to form a completed tuyere nozzle. The tuyere nozzle includes a nose element through which the air enters the furnace, which is formed from high conductivity, oxygen free, rolled or forged copper to resist the most severe temperature and abrasion conditions encountered in a furnace, and the pipe element, which conveys the heated air through the tuyere, is formed from lower thermal conductivity metal, as stainless steel, or ceramic lined metal, to minimize air blast heat loss, controlled water flow for uniform cooling of the hot surfaces, and preferably corrosion resistant to resist the corrosive action of molten lime and slag.

3,727,899

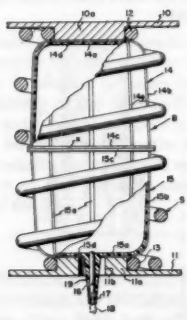
SPRING SUSPENSION UNIT PARTICULARLY FOR VEHICLE SUSPENSION SYSTEMS

Robert C. Pemberton, Lansing, Mich., assignor to Air Lift Company, Lansing, Mich.

Filed April 7, 1971, Ser. No. 132,115

Int. Cl. B60g 11/62

U.S. Cl. 267—34 **14 Claims**



A spring suspension unit adapted to extend between spaced relatively movable members so as yieldably to maintain them in spaced relation and including a coil spring with an inflatable, resilient synthetic plastic bag disposed within the coil springs and expandable to dispose side wall portions of the bag between the convolutions of the spring. The bag is formed of cup-shaped portions having projecting flanges at their open ends which are heat-sealed in abutting air-sealed relation and provide a radially projecting spring convolution engaging ring. Either a valve or a connector forms a part of the bag for facilitating the introduction of air under pressure thereto.

3,727,900

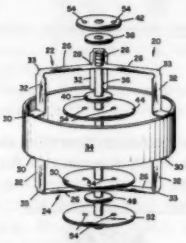
ADJUSTABLE NON-LINEAR SPRING AND SPRING SUSPENSION SYSTEM

Gerald F. Casey, Los Angeles, Calif., assignor to Fema Corporation, Pacioma, Calif.

Filed March 9, 1971, Ser. No. 122,425

Int. Cl. F16f 1/26

U.S. Cl. 267—160 **21 Claims**



The spring, which is useful for obtaining linear motion in electro-mechanical devices, includes at least one leaf spring whose effective length is changed during movement in response to an applied force to vary its spring characteristics. The leaf spring includes a moveable portion to which is secured both a spacer shim and a washer placed over the shim. The radius of the washer is greater than the shim radius so that the washer edge overlays the shim. The arm length of the leaf from a fixed end of the leaf to the moveable portion provides a first force versus stroke characteristic of the spring, as may be represented by a curve, as may be configured substantially as a straight line having a first slope. As the spring moves further under the force, the edge of the washer contacts the leaf in accordance with the radius of the washer and the thickness of the shim so as to shorten the arm length of the spring and to provide a different force versus stroke characteristic, as may be further represented by another substantially straight line curve having a second slope different from the first. The combination of the linear curves produces a spring having a non-linear force versus displacement characteristic. Thus, by varying the thickness of the shim and/or the radius of the washer, and by adding as many additional shims of increasing radii between the washer and the first shim or by attaching similar springs to the original spring, the particular force versus stroke characteristics of the spring may be varied as desired to adjust the non-linear characteristics of the spring ensemble.

3,727,901

DUO COIL CONNECTING DEVICE

Ralph Textrom, Newport Beach, Calif., assignor to Richard P. Gallen, Los Angeles, Calif.

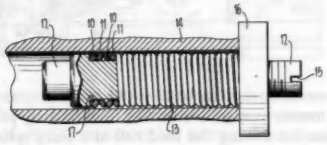
Filed Oct. 12, 1970, Ser. No. 79,747

Int. Cl. F16f 1/06

U.S. Cl. 267—168 **12 Claims**

This invention relates to a coil spring-type connecting device which may be used to connect two pieces of material together, as an expansion bolt, for example, in masonry; as a quick-operating clutch; or a tube connector; or the like. Coil spring invention devices are known as are also the use of double coil springs. The present invention differs from the prior art in that the complete device comprises two coil springs

formed of flattened wire. The two coils are identical, except that the long axis of the flattened wire is tilted at opposed angles to the perpendicular axis of the coil. That is, one coil formed of flattened wire has what might be called a "positive" angle (such as facing to the right in the various figures) to the axis of the cooperating bolt, while the second coil has a negative angle (such as facing to the left). Preferably, the pitch of both coils is identical, and in the preferred form the pitch is approximately twice the distance which a single coil occupies axially of the device. Usually a preferred angle for the two coils is approximately 60°, as shown in FIGS. 2, 5, and 6, but it can be any other angle, such as approximately 30° shown in FIG. 4. The coils can be made of flat strip as shown in FIG. 5 and the pitch can be larger than normal, so that the individual coils are spaced apart as shown in FIGS. 6 and 7; and in fact, a



spacing or third coil may be placed between the angular coils and lying flat against the cooperating bolt. It is believed obvious that compression of the spring will twist the normal angle from that shown in FIG. 2 to that shown in FIG. 3, whereby the coil tightly engages the hole or cavity in which the connecting device is placed. If the coils are made of flat strip, as shown in FIG. 5, it is obvious that the edges of the coils will cut into one or the other or both of the cooperating members, i.e., the bolt or the cavity. When the connecting device is to be used for an expansion bolt in masonry, brickwork, or other material which has a tendency to crumble, it is preferred that the coils be spaced apart as shown in FIGS. 6 and 7, so that material displaced from the cavity wall by the expansion of the connecting device will have a place to rest without interfering with the actions of the coils.

3,727,902

COIL COMPRESSION SPRING

Manfred H. Burckhardt, Waiblingen; Hans-Herbert Wupper, Oberhaunstadt/uber Ingolstadt (Donau), and Siegfried Worbis, Jesingen/uber Plochingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertwerkheim, Germany

Filed April 27, 1971, Ser. No. 137,834

Claims priority, application Germany, April 28, 1970, P 20 20 678.4

Int. Cl. F16f *1/08*

U.S. Cl. 267—180 **21 Claims**

A coil spring with progressive characteristics, especially for the installation in brake valves of motor vehicles, in which the progressivity of the characteristics are realized by ground surfaces in the form of a truncated cone on one or both sides of a cylindrical coil spring made in the customary manner.

3,727,903

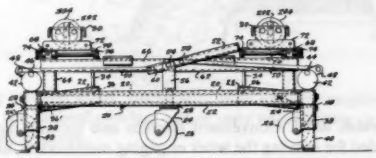
FURNITURE TRUCK FRAME

Joseph L. Brown, Charlotte, N.C., assignor to Brown Truck and Trailer Manufacturing Company, Charlotte, N.C.

Filed Jan. 18, 1971, Ser. No. 107,276

Int. Cl. B23q *37/00, 3/18;* **B25h** *5/00*

U.S. Cl. 269—17 **5 Claims**



A truck for supporting furniture frames or the like comprising a wheeled base structure and a pair of laterally movable supporting elements each of which is mounted on the base structure by two support arms fixed separately to sleeve elements carried exteriorly on longitudinally extending base elements, each support arm extending beyond one end of the sleeve element to which it is fixed and each sleeve element being carried on its base element by longitudinally spaced rollers disposed respectively to ride the upper and lower surfaces of the base element with the roller disposed for riding the upper base element surface being located substantially nearer the end of the sleeve element from which the support arm extends. Additionally, the supporting elements may be mounted on the base element for selective vertical movement with respect thereto and a plurality of jacking legs may be mounted on the base structure with an operating arrangement for simultaneously and selectively lowering these legs to extend beneath the truck wheels whereby the truck is supported solely by these legs.

3,727,904

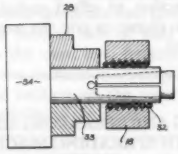
CONCENTRICITY COIL FOR SCREW THREADS

Eric G. Gabbey, P.O. Box 43271, Los Angeles, Calif.

Continuation of Ser. No. 773,529, Nov. 5, 1968, abandoned. This application March 12, 1971, Ser. No. 123,911

Int. Cl. B23q *3/06*

U.S. Cl. 269—52 **1 Claim**



A coil of wire is provided which can be placed on the screw thread of a bolt or nut in order to provide a surface for holding the bolt or nut in the jaws of a chuck or the like. This permits the fastener to be held in a chuck on a known surface which assures concentricity with the axis of the pitch diameter and in a manner which eliminates damaging the threads.

3,727,905

SHANK AND HEAD MOUNTING FIXTURE

Robert F. Haven, R.D. No. 1 Stock Road, Hannibal, N.Y.

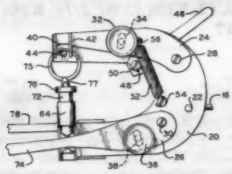
Filed Dec. 6, 1971, Ser. No. 205,030

Int. Cl. B25b *1/06, 1/16;* **B23p** *5/00*

U.S. Cl. 269—224 **13 Claims**

A clamping fixture especially suited for holding the shank and head portions of a ring or the like, during manufacture or repair of jewelry, particularly engagement rings, or related

style solitaires. The ring shank, or annular portion, is externally engaged by two members, one on each side of a stud which internally engages the ring shank. The portion to be attached, i.e., the ring head, is held in engagement therewith by



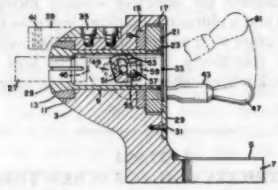
a movable anvil. Convenient handles and locking means are provided for moving the work engaging members to, and holding them in, a desired position. Adjusting means are also provided for maintaining the various elements in desired respective positions and orientations.

3,727,906

WORK HOLDING FIXTURE

Orlando Mileti, Athens, N.Y., assignor to James A. Warren and Leonard H. Warren, Coxsackie, N.Y., part interest to each

Filed Nov. 12, 1970, Ser. No. 88,858
Int. Cl. B23b *5/34*; **B23g** *3/06*
U.S. Cl. 269—287 **1 Claim**



Discloses a work holding fixture or collet fixture, and embodiments thereof, for holding a work piece for machining operation or operations. The work holding fixture comprises a main body having a bore therethrough receiving therein a clamping element or collet having a camming surface engaging a camming surface of another element cooperating upon appropriate lever action to effect radial movement of the clamping element to clamp or grip the work piece inserted in the clamping element.

3,727,907

CLOTH FEEDING AND SPREADING MECHANISM FOR CLOTH SPREADING MACHINE

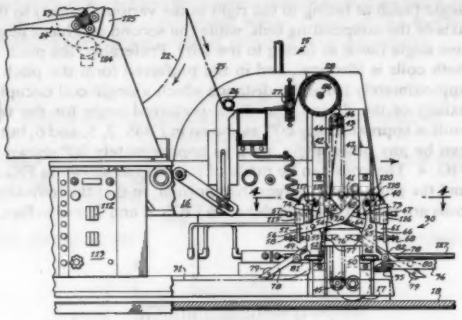
Thomas W. Martin, Sr., and Thomas W. Martin, Jr., both of Nashville, Tenn., assignors to Cutters Machine Company, Inc., Nashville, Tenn.

Filed Sept. 21, 1970, Ser. No. 73,983
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 **9 Claims**

A spreading mechanism for a cloth spreading machine incorporating a pair of pivotally supported depending opposed tuck blades for cooperation with a conventional catcher mechanism in such a manner that the leading tuck blade is elevated by the catcher to swing away from the trailing tuck blade.

Each tuck blade is provided with a link member and a latching member so that when the leading tuck blade is swung upward away from the trailing tuck blade, the latch members engage the opposing link members to latch the trailing tuck blade in its spreading position, while the leading tuck blade is latched in its elevated non-spreading position.

A cloth feed mechanism for the spreading machine including a positively driven cloth feed roll, a first drive means for driving the feed roll at a normal speed related to the movement of the machine over a spreading table; a second drive means responsive to the cloth tension for driving the feed roll



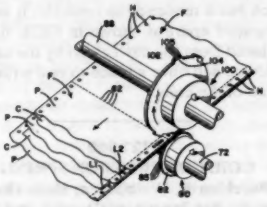
at a second speed faster than the normal speed; and a third drive means responsive to the end-folding position of the machine for driving the feed roll at a third speed faster than the first speed.

3,727,908

CONTINUOUS BUSINESS FORMS

Lloyd M. Whitesell; Louis Schriber, and Raymond M. Loase, all of Dayton, Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 22,513, March 25, 1970, abandoned. This application Aug. 17, 1970, Ser. No. 64,193
Int. Cl. B42b *1/02*
U.S. Cl. 270—53 **7 Claims**



Successively connected business forms are produced by feeding a plurality of paper webs and interleaving carbon webs from corresponding supply rolls into overlying relation and gluing together corresponding longitudinal edge portions of the webs. Lines of cross-perforations are formed in the overlying webs at longitudinally spaced intervals, and the edge portions of the webs are bonded or welded together across or adjacent each line of cross-perforations by a plurality of transversely extending impressions of intermeshing fibers which prevents relative longitudinal shifting of the webs when the webs are zig-zag folded before the glue sets. Preferably, the impressions are located at the fine longitudinal glue lines joining the paper webs to provide fast drying of the glue.

3,727,909

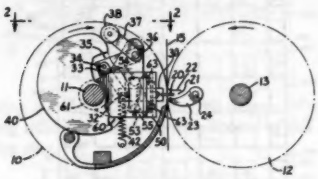
DEVICE FOR THE TILTING OF THE FOLDING BLADE OF A FOLDING-BLADE CYLINDER

Harry M. Greiner, Offenbach, and Karl Langer, Heusentamm, both of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach am Main, Germany

Filed Oct. 23, 1970, Ser. No. 83,435
Claims priority, application Germany, Nov. 4, 1969, P 19 55 351.6
Int. Cl. B65h *45/16*
U.S. Cl. 270—71 **6 Claims**

Folding cylinders for handling the product of a printing press or the like in which a tucker blade in one of the cylinders

engages the web, or associated webs, for tucking into an oppositely phased jaw or groove in the other cylinder, the blade being mounted in the blade cylinder for timed rocking movement about an axis which lies approximately on, or somewhat outside of, the rolling circle so that the blade, and particularly the edge thereof, moves into the jaw cylinder in a direction



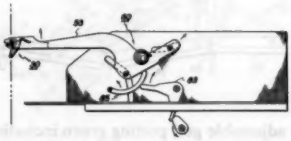
radially of the jaw cylinder. In a preferred embodiment of the invention the blade is guided in its rocking movement along arcuate track of slightly non-circular or oval contour so that the center of rocking movement is constantly varied in accordance with the angle of rocking, shifting outwardly of the rolling circle as the blade is rocked from neutral position.

3,727,910

SHEET SEPARATOR CONTROL APPARATUS

Kishore N. Vora, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed April 26, 1971, Ser. No. 137,390
Int. Cl. B65h *3/56*
U.S. Cl. 271—19 **4 Claims**



Apparatus to control the operation of corner separator members operating to separate individual sheets from the top of the stack as they are depleted. A pair of sheet separator members positioned at the stack corners resist the movement of the sheets to force only the topmost sheets to buckle thereover and be fed therepast. The separator members, each mounted on an arm, move in a generally vertical path as the sheets are fed from the top of the stack. As the stack height decreases a biasing action enables pivotal movement of the separator member on the arm as contact is made with the stack edge near the bottom. A camming mechanism serves to raise the arm and separator member upwardly upon insertion of a new stack by mechanical actuation or an electrical signal.

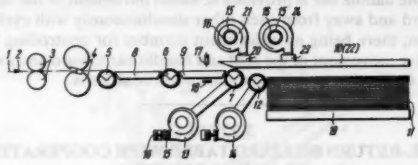
3,727,911

METHODS AND APPARATUS FOR PROVIDING AN OVERLAP BETWEEN INDIVIDUAL SHEETS IN PREPARATION FOR SUBSEQUENT STACKING

Hilmar Vits, Huscheirath, Germany, assignor to VITS Maschinenbau GmbH, Langenfeld (Rhineland), Germany

Filed April 22, 1971, Ser. No. 136,348
Claims priority, application Germany, April 30, 1970, P 20 21 375.6
Int. Cl. B65h *29/24*
U.S. Cl. 271—71 **14 Claims**

This is a method of providing an overlap between individual sheets in preparation for subsequent stacking by accelerating each sheet in comparison with the web feeding speed and then decelerating it down to stacking speed. It is characterized by



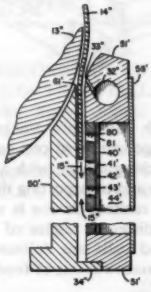
applying to each sheet, during the time interval required to provide the desired overlap, either only accelerating or only decelerating forces.

3,727,912

CARD BRAKE

Leroy A. Vos, Saint Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,438
Int. Cl. B65h *9/14*
U.S. Cl. 271—51 **2 Claims**



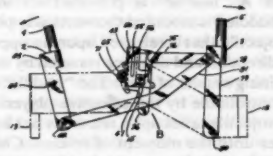
In a system employing a rotating magnetic head drum and a plurality of magnetic cards retained in a cartridge, a braking means which stops the motion of a card as it is transported from the cartridge to a fixed, predetermined position around the drum's periphery. The brake comprises a plate having a plurality of holes therein with a partial vacuum being formed on a first side of the plate. A pick-off means picks off the leading edge of card as it is being transported from the cartridge to its fixed position around the drum and diverts said card along a path adjacent the second side of said plate. The partial vacuum effect pulls the card into friction contact with said plate and thereby slows its motion. A stop bar is positioned to completely stop the motion of the card after it has been slowed down substantially by the plate.

3,727,913

BICYCLE TYPE EXERCISING MACHINE

Harold Glaser, Frontenac, and Charles H. Steuber, St. Peters, both of Mo., assignors to Innovex Incorporated, St. Louis, Mo.

Filed Dec. 20, 1971, Ser. No. 209,783
Int. Cl. A63b *23/04*
U.S. Cl. 272—73 **10 Claims**



A bicycle exercising machine comprising a seat and a handle bar, pedal members for receiving the user's feet, and a

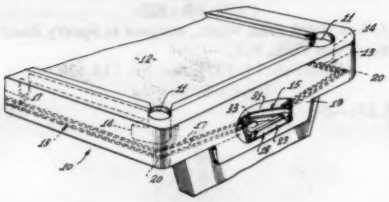
mechanism for rotating the pedal members to simulate bicycle riding. Motion transmitting linkage interconnecting the seat and the handle bar is provided to effect movement of the same toward and away from each other simultaneously with cycling action; there being an adjustment member for controlling the relative movement of the seat and handle bar toward and away from each other to accommodate users of all sizes.

3,727,914

BALL-RETURN BILLIARD TABLE WITH COOPERATING RACKING DEVICE

Marvin A. Miller, 4323 W. Pico Boulevard, Los Angeles, Calif.

Filed Sept. 17, 1971, Ser. No. 181,299
Int. Cl. A63d *15/00*
U.S. Cl. 273—11 R **4 Claims**



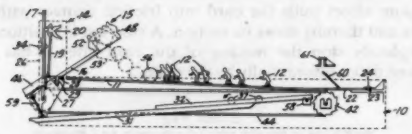
A billiard table with ball-return tracks leading from the pockets to a ball-storage station at one end of the table, and having a triangular racking device with a removable bottom wall for collecting balls and transporting them to the table in a triangular group. The racking device is supported with one corner elevated, and different angles of incline toward the other two corners, and balls are delivered to the elevated corner by various alternative forms of feeder paths associated with the tracks.

3,727,915

SIMULATED FOOTBALL GAME

Roland W. Anderson, 16032 Dawn Drive, Minnetonka, Minn.

Filed Oct. 12, 1971, Ser. No. 188,122
Int. Cl. A63f *7/06*
U.S. Cl. 273—94 R **8 Claims**



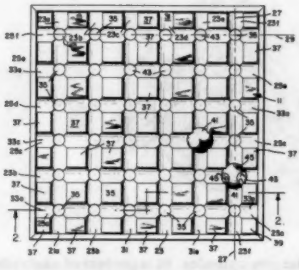
A game combining skill and chance for simulating a football contest between two opposing teams is disclosed. The game includes an elongated plate marked to simulate a portion of a football playing field and defensive players are movably positioned thereon. A "huddle" is provided for the offensive players. The "huddle" is mounted to a vertically pivotable arm and holds a projectile that is released upon an upper tilt of the lever with the direction and distance traveled by the projectile in part determining results of play. The "huddle" is remotely and secretly controllable by the offensive players so that the direction the projectile takes upon release is not known by the defensive player until the moment of release. Chance is provided by a play result indicator which utilizes a tiltable plate for rolling balls to a play result indicator; the play result indicator being presetable to the type of play desired by the offensive player.

3,727,916

GAME DEVICE

Judith R. Miller, Box 283, Palos Verdes Estates, Calif.

Filed May 17, 1971, Ser. No. 144,046
Int. Cl. A63f *9/08*
U.S. Cl. 273—153 S **4 Claims**



A boxed game device capturing a number of symbol-bearing game-pieces, such as multi-numbered spheres or polyhedrons, in a grid composed of top-slotted, intersecting, cylindrical canals. All game-pieces are visible and can be moved and/or rotated by hand in the canals through the slots. Shallow concavities may be placed at the base of canal intersections to provide stabilizing positions for the game pieces.

3,727,917

VARIABLE CONTOUR GOLF PUTTING DEVICE

George D. MacLean, 2713 Daly Avenue, Spring Lake, N.C.

Filed Sept. 29, 1971, Ser. No. 184,772
Int. Cl. A63b *67/02*
U.S. Cl. 273—176 H **6 Claims**

A portable adjustable golf putting green including a plurality of hingedly interconnected base sections extendable to form an elongated golf putting surface in conjunction with a flexible continuous associated surface covering. The apparatus is adjustable for varying putting surface contours, and is collapsible to an easily portable package by interconnecting adjoining base sections with hinges located alternately at the top and bottom surfaces thereof. Also provided is a plurality of pegs and blocks for supporting adjacent base sections at different selective elevations.

3,727,918

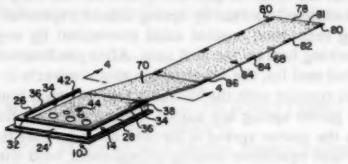
PORTABLE GOLF GAME

Walter Zawacki, St. Petersburg, Fla., assignor to U.S. Turf Corporation, St. Petersburg, Fla.

Filed May 24, 1972, Ser. No. 256,295
Int. Cl. A63b *67/02*
U.S. Cl. 273—176 FB **8 Claims**

A portable golf game comprises a) a base including a flat center panel, a rim surrounding the back and sides of the center panel; three rows of depressed pockets in the center panel for receiving a golf ball, and a channel wall joining the rim to the center panel, and b) a synthetic grass strip secured to and overlying the center panel, and having a plurality of openings aligned with the drpressed pockets of the center panel. The grass strip extends past the front of the center panel to provide a longitudinal putting surface. The first, second and third rows of pockets include one, two and three holes, respectively. The pockets in the first and second rows are offset from each other and have equal diameters which are less than the diameters of the pockets in the third row, which

latter pockets are offset from the pockets in the second row. The bottom walls of all the depressed pockets are provided

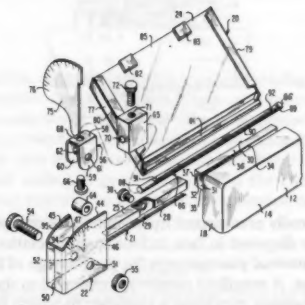


with scoring indicia which makes the degree of difficulty of a succeeding shot depend upon the success of the immediately preceeding shot.

3,727,919
GOLF CLUB INCLUDING IMAGE REFLECTOR ATTACHMENT

John Wright Martin Scott, Gordon, Ga.

Continuation-in-part of Ser. No. 772,351, Oct. 31, 1968, Pat. No. 3,507,500. This application April 17, 1970, Ser. No. 29,550
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 A **3 Claims**



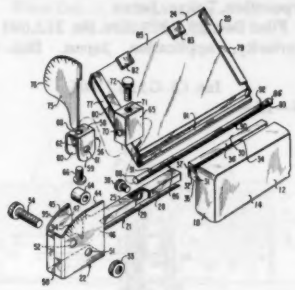
A golf club attachment comprising a sighting apparatus including a mirror to reflect the image of the area ahead of the club head in an upward direction to the eyes of the golfer which enables the golfer to align the face of the club head with a golf ball and the flagstick used on the putting green of a golf course. The mirror is pivotable about a first axis normal to the ball striking surface of the club head and also about a second axis normal to the first axis. The attachment is detachably secured to the club head by a channel shaped connecting arm which may be slid along an L-shaped support bar mounted on the rear surface of the club head.

3,727,920
GOLF CLUB ATTACHMENT

John Wright Martin Scott, Gordon, Ga.

Division of Ser. No. 29,550, April 17, 1970, which is a continuation-in-part of Ser. No. 772,351, Oct. 31, 1968, Pat. No. 3,507,500, which is a continuation-in-part of Ser. No. 568,232, July 27, 1966, Pat. No. 3,421,765. This application Oct. 18, 1971, Ser. No. 190,103
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 A **6 Claims**

A golf club attachment comprising a sighting apparatus including a mirror to reflect the image of the area ahead of the club head in an upward direction to the eyes of the golfer which enables the golfer to align the face of the club head with a golf ball and the flagstick used on the putting green of a golf course. The attachment includes a housing, a clevis assembly in the housing, a first arm for mounting the housing to a golf club head and a second arm which supports a mirror reflecting surface. The mirror is rotatable about the longitudinal axis of the second arm and pivotable in a vertical plane passing

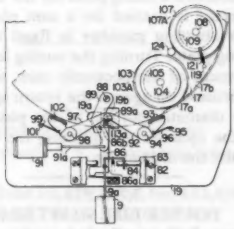


through the longitudinal axis of the second arm. Indicia scales are provided on the housing for adjusting the position of the mirror relative to the housing.

3,727,921
MAGNETIC RECORDING AND REPRODUCING APPARATUS OF THE SPIRAL TRACK TYPE

Saburo Kato, Ohta-ku, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1971, Ser. No. 192,877
Claims priority, application Japan, Nov. 5, 1970, 45/97444
Int. Cl. G11b *5/82, 21/04*
U.S. Cl. 274—4 J **10 Claims**

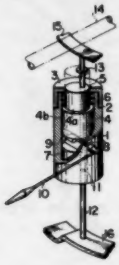


In apparatus for magnetically recording and/or reproducing information in a spiral track on a magnetic recording sheet, wherein the sheet is held in a fixed and downwardly facing position while a magnetic head is advanced by means including a turntable along a spiral inwardly directed path in contact with the sheet, mechanism for starting and stopping the turntable by successive depressions of a single button. The mechanism includes an actuation member movable between positions at which it respectively connects and disconnects the turntable and suitable drive means, and a slider connected to the button for moving the actuation member to a drive-connecting position on initial depression of the button, and unlocking the actuation member for return to drive-disconnecting position upon second depression of the button. The slider and actuation member are so arranged that the change from drive connection to disconnection occurs as the button is depressed. The apparatus further includes means for counting revolutions of the turntable, driven by an idler continuously in contact with the turntable, and means for automatically stopping the turntable upon completion of a recording or playback operation, as well as button-controlled means for effecting recording operation, and quick feed and reverse motion of the turntable.

3,727,922
TONE ARM LIFTING DEVICE FOR AUTOMATIC RECORD PLAYER

Toyonori Igata, Skizuoka, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 29, 1971, Ser. No. 213,601
Claims priority, application Japan, Dec. 29, 1970, 45/133341
Int. Cl. G11b 17/06
U.S. Cl. 274—15 R 5 Claims

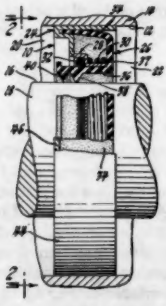


A tone arm lifting device for an automatic record player which is operable both manually and automatically. The lifting device comprises a cylinder and a piston adapted to slide within the cylinder. The piston has a smaller diameter portion in its upper portion, and is biased downwardly by a coil spring which tends to maintain it in its rest position. In the larger diameter portion, the piston is provided with a notch in which an eccentric cam is mounted for up and down movement of the piston. The cam is so arranged as to be rotatable by a cueing lever. The piston is also provided with an axial bore in which a lifting rod is axially movable. On the top of the lifting rod, there is mounted a lifting plate for the tone arm while the lower end thereof is carried on a cam plate for automatic operation. An abutting member is fixed to the lifting rod below the lifting plate. Turning the cueing lever causes an angular displacement of the eccentric cam, which permits the piston to be thrusted up against the return spring. This results in the smaller diameter portion of the piston protuding upwardly from the cylinder and pushing the abutting member upwardly to raise the lifting rods.

3,727,923
DOUBLE LIFE SHAFT SEAL

John C. McEwen, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1971, Ser. No. 195,971
Int. Cl. F16j 9/06, 15/00
U.S. Cl. 277—9 3 Claims

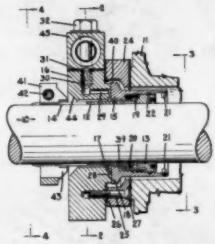


A double life shaft seal includes a seal case and an elastomeric sealing annulus having first and second seal lips adapted to be sequentially contacted by a rotating shaft. A tensioned garter spring is initially located on the sealing annulus so as to bias the first seal lip into operative sealing engagement with the shaft to provide a first service life, the spring being positioned thereat by spring biased expanded constriction ring restrained against axial movement by engagement with blocking lugs on the seal case. After predetermined wear of the first seal lip, the constriction ring contracts in diameter and loses contact with the blocking lugs at which time the ring and the garter spring are axially shifted to a second position wherein the garter spring is located so as to bias the second seal lip into operative sealing engagement with the shaft to provide a second service life.

3,727,924
EXTERNALLY PRESSURIZED SEAL

Douglas J. Henderson, Mississauga, Ontario, Canada, assignor to Champlain Power Products Limited, Rexdale, Ontario, Canada

Filed July 8, 1970, Ser. No. 53,225
Int. Cl. F16j 15/00; B65q 53/00
U.S. Cl. 277—23 6 Claims

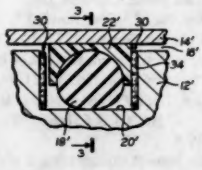


An externally pressurized hydrostatic seal comprises a rotor and a stator disposed in face to face sealing relation, the stator providing internal passageways for the passage of liquid to the sealing faces. A manifold member is clamped to the stator, the manifold member providing a chamber to which liquid is supplied under pressure, and a series of fine orifices through which the liquid flows from the chamber into the passageways, the manifold member being readily replaceable so that if the seal becomes inoperative by blockage of the orifices, the fault may be easily remedied.

3,727,925
ANTIBLOW-BY RINGS

David W. Jones, Long Island, N.Y., assignor to C. E. Conover & Co., Inc., Fairfield, N.J.

Filed Dec. 22, 1970, Ser. No. 100,649
Int. Cl. F16j 15/46
U.S. Cl. 277—165 10 Claims



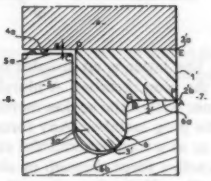
This invention is an improvement in cap type seals that are used with O-rings. It provides a special ring, in the end of a groove that holds the seal, with radial passages in the special ring for equalizing pressure above and below the cap to

prevent collapsing of the O-ring and failure of the seal under severe operating conditions, such as high amplitude pressure reversals that are so rapid that the seal does not have time to move and admit pressure to the clearance under the seal before the high pressure impulse of the reversal drives the seal down.

3,727,926
SEALING GASKET AND SEALED JOINT USING THE SAID GASKET

Jean-Luc Berry, 27 Mesnil sur L'Estree, France, assignor to E. P. Remy et Cie, Dreux, France

Filed July 29, 1971, Ser. No. 167,308
Claims priority, application France, Aug. 6, 1970, 7029083
Int. Cl. F16j *15/10*
U.S. Cl. 277—212 F **5 Claims**



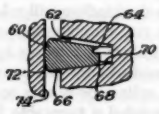
The invention relates to a sealed joint comprising a first and a second member between which is formed a substantially L-shaped cross-sectional recess in which is placed a gasket which has a corresponding L-shaped cross-sectional section.

The gasket and the recess are so formed that a continuous and excellent sealing is provided between the two members and the gasket, and that no excessive compression or deformation of the gasket is to be feared.

3,727,927
RING MANUFACTURE, PRODUCTIVE OF LINE CONTACT SEAL

Norman M. Packard, Des Plaines, Ill., assignor to International Harrester Company, Chicago, Ill.

Division of Ser. No. 757,973, Sept. 6, 1968, Pat. No. 3,587,155. This application Aug. 6, 1970, Ser. No. 61,560
Int. Cl. F16j *9/20*
U.S. Cl. 277—216 **3 Claims**

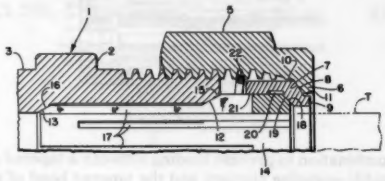


Methods, apparatus, and improved structure having as their common basis the sequence of collapsing a piston ring in a fixture approximating engine bore diameter, and lapping a locality at the side of the ring while so collapsed, until a circumferentially continuous portion—narrow in width and preferably line size—of the side is flat in the range of at least about 10 to 5 light bands at standard inspection wavelength. One of the broadest methods disclosed is the use exclusively of rings so carefully made and so lap inspected as above on a percentage basis that the inner peripheral edge at the side has all points thereon in coplanarity to a degree equivalent to the stated range to seal in absolute contact in a substantially continuous sealing ring.

3,727,928
COLLET CHUCK

Milton L. Benjamin, Chagrin Falls, Ohio, assignor to Erickson Tool Company, Solon, Ohio

Filed Oct. 2, 1970, Ser. No. 77,674
Int. Cl. B23b *31/20*
U.S. Cl. 279—1 L **5 Claims**



A collet chuck of the type wherein a nosepiece having screw-threaded engagement with the chuck body forces a contractible collet axially inwardly of the body to effect contraction of the collet through a nose ring interposed between the axially outer end of the collet and an inturned shoulder on the nosepiece, the collet chuck herein being characterized in that the nose ring has a close axially telescoping fit with the axially outer end portion of the collet and a radial clearance fit within the nosepiece so that the nose ring and collet remain coaxial during operation of the chuck so as to accurately grip a tool or the like with its axis substantially coinciding with the axis of the chuck body.

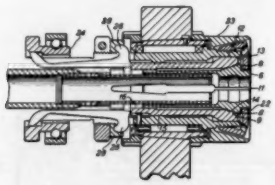
3,727,929
PRECISION AIR CHUCK

Anton Fink, Albertson, N.Y., assignor to Metrology System Corporation

Filed June 14, 1971, Ser. No. 152,650
Int. Cl. B23b *31/30, 31/16*
U.S. Cl. 279—4 **10 Claims**

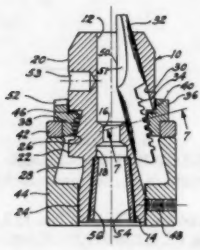
An air actuated multi-jaw chuck. The jaws are actuated by a piston coupled to the jaws by means of an angularly deployed key which mates with a keyway connected to the jaw. Means are provided for adjusting the relationship between the jaw and the actuating mechanism. This permits the achievement of extreme concentricity. A radially acting collet accepts workpieces whose diameters might vary by as much as 0.040 inches and still maintain concentricity.

3,727,930
TAPERED CHUCKING ASSEMBLY
Clarence W. Anderson, 7813 W. Carmen, Norridge, Ill.
Filed Sept. 30, 1971, Ser. No. 185,294
Int. Cl. B23b *31/10*
U.S. Cl. 279—50 **10 Claims**



A combination to prevent binding between a tapered seat in a rotatable engaging element and the tapered head of a split, spring collet for holding work stock, said means providing a spiral groove on one of the tapered surfaces, which spiral groove is opposite to the direction of rotation of the engaging element.

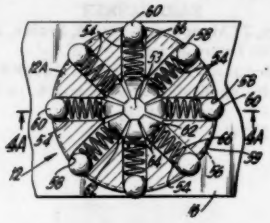
3,727,931
PRECISION CHUCK
Lawrence W. Wightman, St. Louis, and Thomas J. Long, Bridgeton, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed April 6, 1971, Ser. No. 131,662
Int. Cl. B23b *31/04*
U.S. Cl. 279—62 **5 Claims**



A key-operated universal drill chuck having round elongated jaws slidably guided in forwardly converging bores arranged around a central axis in a chuck body, which jaws are slidably moved in their bores by a key-operated traverse nut having internal screw threads engaging screw thread sections formed on each jaw, the traverse nut being made adjustable along the body axis whereby the clearance between the engaging screw threads on the traverse nut and on the jaws may be adjusted to minimize rotational movement of the round jaws in their bores, and the chuck body further including a loosely fitting drive shaft receiving bushing cemented thereto precisely concentric and in alignment with a fixture cylinder gripped in the chuck jaws.

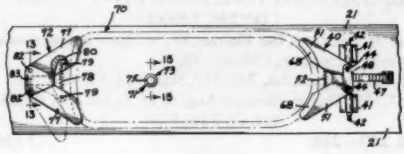
3,727,932
SKI BINDING
Barry Lewis Druss, and Kendall Scott Williams, both of Aspen, Colo., assignors to Chimera Research and Development, Inc., Holliswood, N.Y.
Filed March 30, 1970, Ser. No. 23,876
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 K **26 Claims**

A ski binding comprising but a single connection between the ski boot and the ski. The essential elements of the binding consist of a plug member and an interengaging socket member, one member being associated with the ski boot and the other with the ski. Optionally, a boot plate may be used to which the respective member may be attached in a conventional manner. In a preferred form, the plug member has simple screw means to adjust the force of loading interengaging spheres or balls, which is the desired release force by which the plug member is allowed to become detached from the



socket member. The latter is an annulus of a diameter sufficient to receive the plug member. A plurality of recesses are spaced on the inner wall of the socket member to register with the spheres of the plug member. Any force whether longitudinal of the ski, or as a torque about the skier's body or legs, will develop a reactive force through or about the geometric center of the binding. If the force is sufficient in magnitude and duration an automatic separation of the engaging members is effected in response to the force.

3,727,933
SKI BINDING
Ivor J. Allsop, Bellingham, Wash., assignor to Jon I. Allsop; Michael G. Allsop and James D. Allsop, all of Bellingham, Wash.
Filed Sept. 21, 1970, Ser. No. 73,893
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **2 Claims**

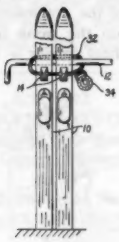


A ski binding adapted to release under predetermined conditions, and wherein the binding will release in a forward fall, or a twisting fall or any combination of the forward fall or twisting fall. The ski binding releases by rotation on or near the ball of the foot, and wherein the contact points of the heel and toe may be on rollers or hinges to reduce friction, and wherein there is provided a turntable for the ski boot. The binding is so constructed that in a forward twisting fall, the heel will release before any pressure is applied between the sole of the boot and the ski at the toe thereof.

3,727,934
SKI PROTECTIVE DEVICE
Charles J. Averbook, 809 Hill Street, Suite 2, Ann Arbor, Mich., and Robert J. Schmier, 1843 Lake Lila, Ann Arbor, Mich.
Filed May 17, 1971, Ser. No. 144,007
Int. Cl. A63c *11/02*
U.S. Cl. 280—11.37 K **1 Claim**

An anchoring loop for attachment to an article to be secured such as skis in the form of a strip of metal having its ends bent toward each other to form a base in a common

plane, the remainder of the strip looping above the base for threading of a locking device. The loop is narrowed centrally



to reduce impaction of snow and ice and to facilitate mechanical attachment which is to be supplemented by adhesive attachment.

3,727,935

RELEASABLE HEEL REATINER

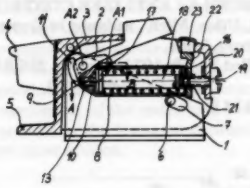
Paul Unger, Bructwiesenstr. 113, 8501 Altenberg, Germany

Filed June 2, 1971, Ser. No. 149,215

Claims priority, application Germany, June 4, 1970, P 20 27 412.8

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 T **12 Claims**



Releasable heel retainer for a ski binding that is provided on the base portion secured to the ski pivotally mounted for movement about a horizontal axis that extends longitudinally of the ski and the housing of which carries a sole holder, where inside the housing a release is disposed that acts against spring effect and causes the release of the ski boot under excessive load, which housing is displaceably journalled and supported on the base at the end remote from the sole retainer so that there results a slide crank type connection of the housing on the base, and displaceable mounting of the housing on the base is in the form of a guide means that protects the housing against rising from the base, and where furthermore a means is provided that is releasable manually or by a foot-step that fixes the open position of the retainer, and which heel retainer includes the improvement of the arrangement serving as the crank pivotally engaging the spring and this linkage slidingly engages a curved slot of the base which slot rises upwardly in the direction toward the sole retaining element, and where the linkage of the crank secured to the housing is disposed in a known manner ahead of the linkage of the crank on the base part secured to the ski.

3,727,936

SKI OF SHAPED LAMINATED MATERIAL AND METHOD FOR ITS MANUFACTURE

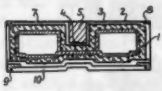
Jiri Klir, Praha; Bohumil Svoboda, Pardubice, and Jaroslav Bohac, Nove Mesto Na Morave, all of Czechoslovakia, assignors to Vyzkumny ustav Strojirenske technologie a ekonomiky, Praha, Czechoslovakia

Filed May 18, 1970, Ser. No. 38,130

Claims priority, application Czechoslovakia, May 23, 1969, PV 3665-69; April 7, 1970, PV 2310-70

Int. Cl. A63c 5/12

U.S. Cl. 280—11.13 L **8 Claims**



A ski of shaped laminated material made as a hollow closed beam with integral walls with at least one longitudinal groove formed in the upper wall, housing a reinforcing strip. The ski being manufactured by applying a yielding fabric soaked with hardenable resin on a resilient hose, placing the whole into a mould and buildings up pressure in said hose under simultaneous heating to the hardening temperature.

3,727,937

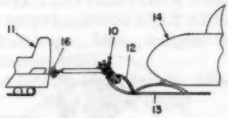
SNOWMOBILE TOWING HITCH

Earl G. Maki, Jr., Sullivan, Wis.

Filed Jan. 5, 1972, Ser. No. 215,539

Int. Cl. B62b 13/00

U.S. Cl. 280—24 **5 Claims**



A hitch for towing one snowmobile with another which can be quickly disassembled for storage and transporting and readily reassembled for use. The hitch has a T-shaped tongue having an extendible cross member assembly. The outer ends swivel about the elongate axis of the cross member assembly. A pair of attaching clamp units are pivotally mounted in the swivel ends of the cross member assembly for clamping on the toe braces of the skis of a snowmobile which is to be towed.

3,727,938

VEHICLE WHEEL SUSPENSION AND MOUNTING MEANS

Edgar R. Goodbary, and James E. Thompson, both of Tulsa, Okla., assignors to Unit Rig & Equipment Company, Tulsa, Okla.

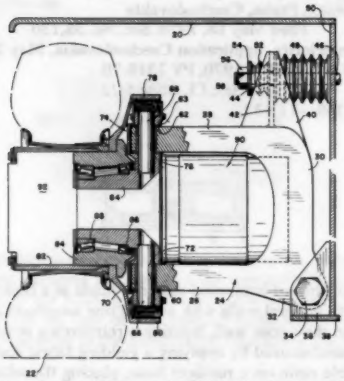
Continuation of Ser. No. 842,467, July 17, 1969, abandoned. This application July 26, 1971, Ser. No. 166,275

Int. Cl. B60g 3/00

U.S. Cl. 280—96.2 **2 Claims**

A wheel mounting and suspension means for large wheels and vehicles wherein each wheel is independently mounted on the vehicle and independent wheel motors are provided for driving the vehicle wheels. Each vehicle wheel is carried by an independent yoke or support member which is secured between the wheel and vehicle in a manner to provide a universal mounting for each wheel. The wheel is journalled on the yoke member for rotation about a substantially vertical axis during steering of the vehicle, or the like, and the yoke

member is pivotally secured to the vehicle for rotation about a substantially horizontal axis to provide compensation for roughness or vertical variation in the terrain over which the



vehicle travels. In addition, yieldable shock absorbing means in interposed between the yoke and the vehicle for cushioning or absorbing substantially all the shock due to vertical movements of the wheel during operation of the vehicle.

3,727,939

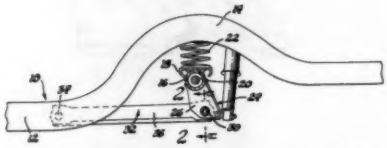
VEHICLE SUSPENSION CONTROL ARM

Petro Mykolenko, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 23, 1971, Ser. No. 155,896

Int. Cl. B60g *7/00*

U.S. Cl. 280—124 R **3 Claims**



A control arm particularly adapted for use in a vehicle suspension system includes a pair of spaced, parallel sides having aligned circular apertures therein, rigid inturned flanges extending around each of the apertures, and a sleeve disposed between the sides and in register with the apertures and with the flanges being closely received within the sleeve. A rubber bushing is received in the passage defined by the sleeve and the flanges and forces exerted on the control arm by the bushing are resisted partially by the portions of the flanges directly engaging the bushing and partially by the reamining portions of the flanges through the sleeve so that an even distribution of force across the control arm is achieved.

3,727,940

SUSPENSION STRUTS FOR INDEPENDENT WHEEL SUSPENSION SYSTEMS OF MOTOR VEHICLES

Karl Hug, Niedernhausen, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed June 29, 1971, Ser. No. 157,865

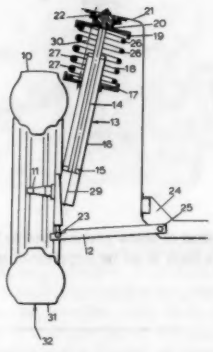
Claims priority, application Germany, July 1, 1970, G 70 24 634.3

Int. Cl. B60g *11/58*

U.S. Cl. 280—124 A **7 Claims**

A suspension strut for an independent wheel suspension of a motor vehicle comprises a telescopic damper with a helical compression spring arranged around the damper and seated at its ends on the cylinder tube and piston rod respectively of the damper. A wheel carrier is connected to the lower end of the damper cylinder tube and projects laterally therefrom.

To compensate for the bending moment produced by the offset disposition of the wheel carrier relative to the damper axis, those portions of the convolutions of the helical spring which are disposed on the same side of the spring as the laterally projecting wheel carrier — corresponding, in use, to



the outboard side of the spring convolutions — are constructed to have a greater polar resistance moment than the portions of the spring convolutions which are disposed on the opposite side of the spring from the spring carrier.

The spring starting material may for instance be circular-section spring stock, which, prior to convolution, has its cross-section locally reduced in area or changed in shape, by metal removal or by press-forming, to produce the portions having a smaller polar resistance moment.

3,727,941

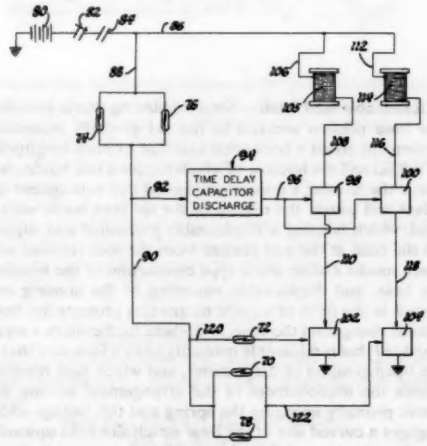
AUTOMOBILE LEVELIZER CONTROL UNIT

Henry J. Ciolli, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1971, Ser. No. 205,834

Int. Cl. B60g *17/10*

U.S. Cl. 280—124 F **4 Claims**



In preferred form, a vehicle leveling system having a load supporting device connected to a fluid supply system includ-

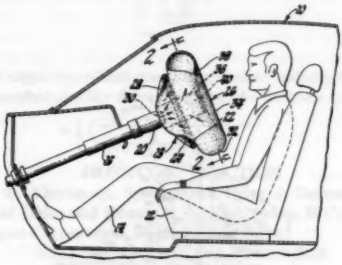
ing first and second solenoid operated valves therein to control flow of leveling fluid to and from the load supporting device. The solenoid operated valves are controlled by a transistorized control circuit and a plurality of minireed switches therein located in a step-by-step relationship and operated by a permanent magnet movable relative to the minireed switches upon relative movement between the sprung and unsprung masses of the vehicle.

3,727,942

INFLATABLE OCCUPANT RESTRAINT CUSHION

Gary L. Arntson, Lansing, and Rom Rasmussen, Okemos, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 3, 1971, Ser. No. 139,638
Int. Cl. B06r *21/08*
U.S. Cl. 280—150 AB **4 Claims**



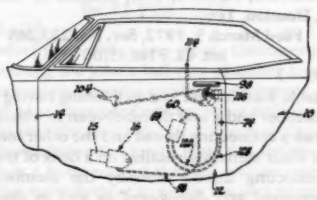
A vehicle body includes a steering column mounting a conventional steering wheel having a hub portion and a rim portion joined to the hub portion by spokes. A conventional gas generating device is mounted on the hub portion. An inflatable cushion includes a generally frusto-conically shaped inner wall mounted on the hub around the gas generator and merging into a generally arcuate cross section side wall which merges into the outer wall of the cushion. The outer wall is intended to be engaged by the driver. A tubular porous member extends from the inner wall around the gas generator to the outer wall to provide for diffusion of the generated gas and to also limit the movement of the outer wall with respect to the inner wall to provide in the former a depression of generally shallow concave cross section.

3,727,943

OCCUPANT RESTRAINT SYSTEM

Algis G. Augunas, Royal Oak; James C. Louton, Jr., Bloomfield Hills, and Roman Rafalik, Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 18, 1971, Ser. No. 144,470
Int. Cl. B60r *21/02*
U.S. Cl. 280—150 SB **5 Claims**



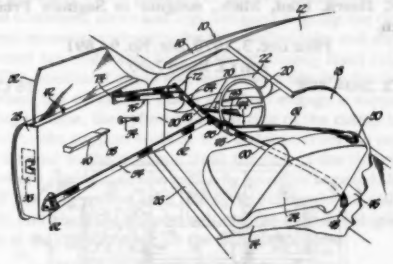
An occupant restrain system for a vehicle body which includes a door movable between open and closed positions and mounting a door lock engageable with a striker on the body for holding the door in closed position. The lock is of the uncoupling type and includes inside and outside release handles connected to an operating lever which is selectively coupled to an uncoupled from the detent for the bolt. A restraint belt includes a lap belt mounted at one end on the floor pan inboard of the seated occupant and a shoulder belt mounted at one end on the seat back or on the roof panel inboard of the seated occupant. The other ends of the belts are integrally or otherwise connected to each other at a belt juncture. A pulley arrangement interconnects the belt juncture and the door for moving the belt juncture forwardly upon opening movement of the door and permitting rearward movement thereof upon closing movement of the door. The belt juncture is also secured to one end of an outboard belt, the other end of which is secured to a belt retractor mounted on the door adjacent the outboard side of the seat cushion. The retractor includes a belt anchoring reeel having ratchet end plates, and a pawl which is normally spring biased into engagement with the end plates to block movement of the reel in a belt extending direction. A control lever is movable into engagement with a pawl extension to move the pawl to released position. The lock operating lever is fixed to one end of a shiftable cable, the other end of which is connected to one end of a second shiftable cable, the other end of which is fixed to the retractor control lever. Movement of the lock operating lever by either release handle shifts the first and second cables and the control lever to release the pawl. A third shiftable cable is connected to the second cable and to the lock bolt. Upon movement of the bolt to unlatched position, the third cable shifts the second cable to also release the pawl of the retractor. The connections between the second cable and the first and third cables permit movement of the second cable by either independently of the other.

3,727,944

CONTROL BELT SYSTEM FOR A VEHICLE BODY OCCUPANT RESTRAINING BELT ARRANGEMENT

Gary A. Wize, Washington, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 28, 1971, Ser. No. 166,799
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **1 Claim**



A control belt system for a vehicle body occupant restraining belt arrangement including a restraining belt whose ends are respectively fixed adjacent upper and lower inboard portions of a vehicle body seat and whose intermediate portion is slidably received within a first apertured member to define lap and shoulder belt portions. The control belt system includes a first control belt with one end attached to the first apertured member, a door mounted retractor normally retracting the other end of the first control belt which maintains the belt arrangement in an occupant restraining position when the door is in closed position and provides a direct path of force between the retractor and the lap and shoulder belt portions, a second apertured member slidable along an intermediate por-

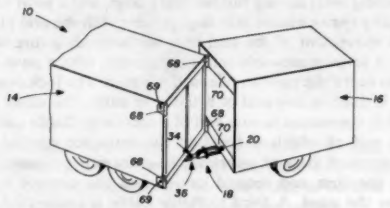
tion of the first control belt, and a second control belt with one end extending between the vehicle body and an upper forward portion of the door in a tackle arrangement and with the other end attached to the second apertured member. During door opening movement, the tackle arrangement is lengthened to retract the other end of the second control belt as the second apertured member slides along the first control belt and moves the belt arrangement forwardly to an easy-enter position.

3,727,945

VEHICULAR HITCHING SYSTEM

John W. Parker, Irving, Tex., assignor to Parker Uptight Trailer Hitch Company

Filed March 29, 1971, Ser. No. 129,022
Int. Cl. B60d *1/02*
U.S. Cl. 280—408 **18 Claims**



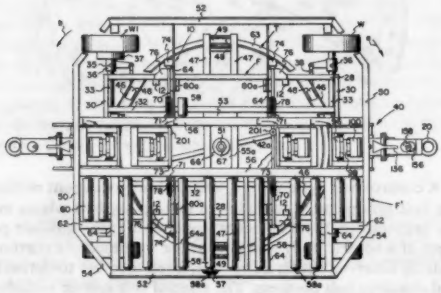
A vehicular hitching system includes a shaft supported on a pup trailer for sliding movement outwardly from the front of the trailer, and air cylinders for biasing the shaft inwardly. A pintle hook is secured to the rear of a mother trailer and receives an eye mounted on the shaft. Four rollers are pivotally mounted at the rear corners of the mother trailer, and roller receiving plates extend across the top and bottom of the front surface of the pup trailer. During a relative turning movement between the trailers, two of the rollers engage and thereafter move across the roller receiving plates. During this action the shaft is drawn outwardly from the front of the pup trailer against the action of the air cylinders.

3,727,946

BAGGAGE CART

Leo E. Hearn, Flint, Mich., assignor to Saginaw Products, Mich.

Filed Dec. 3, 1970, Ser. No. 94,891
Int. Cl. B60d *7/00*
U.S. Cl. 280—408 **16 Claims**



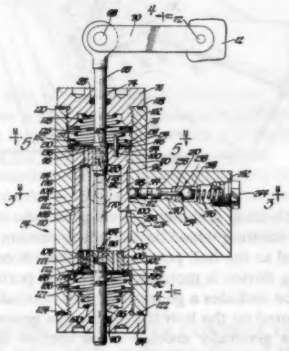
A cart for supporting baggage containers and the like, including a frame supported on surface engaging wheels, a conveying platform rotatably mounted on the frame, apparatus on the frame and the platform cooperating to selectively lock the platform in various predetermined positions relative to the frame, latch assemblies at opposite ends of the conveying platform for securing opposite ends of a baggage container supported thereon, a steering tongue connected to each of the front and rear sets of wheels and pivotally coupled to a tow bar provided at each end, a releasable lock for selectively preventing relative movement of the steering tongue and the tow bar at either end of the cart to provide for selective locking and steering at either end so that when in train, the carts may be readily conditioned to steer from either end, and apparatus for releasably coupling the tow bar of one vehicle to the tow bar of an adjacent vehicle.

3,727,947

HYDRAULIC VALVE FOR VEHICLE LEVELING

Ralph E. Small, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1971, Ser. No. 195,950
Int. Cl. B60p *1/16*
U.S. Cl. 280—124 F **4 Claims**



A three position height control valve having a damping piston, a valve operator and valving components for controlling flow of fluid between a high pressure source, a low pressure source and a leveler unit. The valve piston orifices are varied by adjustable temperature responsive control rods to maintain a uniform damping action. Check valves allow flow of make-up fluid from one end of the piston to the opposite end thereof. They are carried by a tray on the end of the piston and movable apart therefrom to permit a quick return of the damping piston to a centered position.

3,727,948

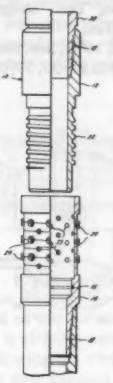
RELEASABLE WELL JOINT

James H. Current, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed March 9, 1972, Ser. No. 233,269
Int. Cl. F16l *35/00*
U.S. Cl. 285—3 **7 Claims**

A releasable joint for use in a well tubing having a male and a female member and a seal therebetween in which one of the members has a connecting thread and the other member has a plurality of shear elements installed on a helix of the same lead as the connecting thread whereby the members may be rotatably engaged and disengaged as well as disengaged by shearing the elements by straight pull. In one embodiment the shear elements are threaded into holes extending through the female member whereby the shear value may be visually observed or changed without disassembling the joint. In another

embodiment the shear elements may be positioned on the male member. The connecting thread may be formed of a plu-



rality of segments which are spring loaded radially toward the other member and the thread may be of a buttress type.

3,727,949

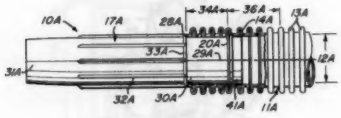
HOSE CONSTRUCTION

Donald L. Kleykamp, Springboro; Peter J. Neroni, Dayton, both of Ohio, and Homer N. Holden, Sylva, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Dec. 20, 1971, Ser. No. 209,829

Int. Cl. A47l *9/24*

U.S. Cl. 285—7 **9 Claims**



An elongated hose construction is provided which is particularly adapted for use on a vacuum cleaner. The hose construction comprises a hose having a plurality of integral convolutions which give the hose optimum flexibility and at least one convolution comprising one end portion of the hose is used to attach a simple, inexpensive fitting thereto in a substantially air tight manner.

3,727,950

DIRT SEAL RING FOR PIPE SWIVEL JOINTS

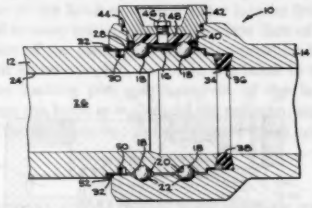
Harold N. Swanson, Anaheim, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 1, 1971, Ser. No. 194,202

Int. Cl. F16l *11/12*

U.S. Cl. 285—13 **6 Claims**

A pipe swivel joint with a one-piece, elastomeric dirt seal ring for protecting the joint's ball race chamber against intrusion of contaminants from the outside environment, and to relieve the ball race chamber from excessive pressure resulting from leakage past the joint's packing. The seal ring is located in the annulus between the joint's male and female elements, and comprises a body portion that fits into an outer annular groove on the male element to retain the seal in proper functioning position, a lip portion that fits tightly against both male and female elements to provide a seal therebetween, and a stretchable intermediate web-like portion interconnecting the body and lip portions. When the swivel joint is fully assembled with the seal ring installed, the intermediate portion is stretched axially to maintain the lip in sealing contact with



both joint elements, precluding entry of outside contamination into the ball race chamber yet facilitating escape of pressure from it to the outside.

3,727,951

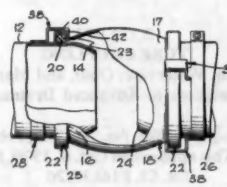
CONNECTOR CLAMP

Harold Shire, Beverly Hills; Ira R. Newman, Lakeview Terrace, and Robert S. Allison, San Gabriel, all of Calif., assignors to General Connectors Corporation, Burbank, Calif.

Division of Ser. No. 886,492, Dec. 19, 1969. This application Feb. 17, 1972, Ser. No. 201,379

Int. Cl. F16l *55/00*

U.S. Cl. 285—93 **5 Claims**



The invention is a generally cylindrical split ring adapted to tightly embrace a thin-walled tube. The ends of the clamp have constricting means for decreasing the diameter of a split ring in order to cause it to tightly embrace the tube. The split ring is provided with a plurality of integrally attached channel shaped combined claws and legs designed to grasp the ribs of a slip joint connector whereby the thin-walled tube and slip joint connector are releasably held in longitudinally fixed relationship. The combined claws and legs have a spacing function in that when the combined claws and legs engage a support or abutting surface, the cylindrical split ring of the clamp is held parallel to the support surface at a distance from the support surface equal to the distance from the end of the thin-walled tube where the cylindrical split ring must be secured. In this way, if the thin-walled tube is inserted through the split ring until its end abuts the support surface, the cylindrical split ring will be at the correct place on the thin-walled tube.

3,727,952

TUBE CONNECTOR

William D. Richardson, Palos Heights, Ill., assignor to Tuthill Pump Company, Chicago, Ill.

Continuation-in-part of Ser. No. 54,288, July 13, 1970, abandoned. This application March 2, 1972, Ser. No. 231,332

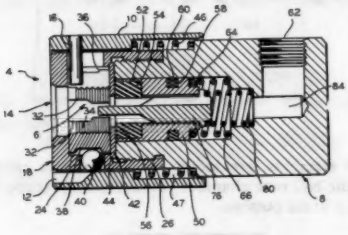
Claims priority, application Canada, April 19, 1971, 110704; France, June 22, 1971, 7122731; Germany, July 12, 1971, P 21 34 732.0; Great Britain, May 6, 1971, 13,531/71; Italy, May 15, 1971, 50367 A/71; Japan, May 26, 1971, 46/35610

Int. Cl. F16l *17/00*

U.S. Cl. 285—101 **17 Claims**

An easily, manipulatable tube connector for connecting apparatus to test equipment and the like, wherein, in an exem-

plary embodiment, the connector utilizes a pair of jaw-like, gripper members for attachment to the equipment to be tested



and the connector is easily positioned to the secured and sealing position by a simple axial movement and is easily and quickly removed thereafter.

3,727,953

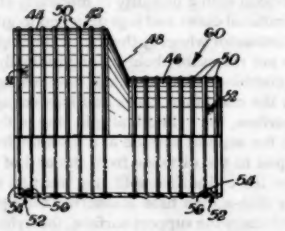
TUBE COUPLING

Ronald C. Martin, Waterville, Ohio, and Marty E. Sixt, Iowa City, Iowa, assignors to Advanced Drainage System, Inc., Newark, Del.

Continuation-in-part of Ser. No. 796,752, Feb. 5, 1969, Pat. No. 3,551,007. This application Oct. 6, 1970, Ser. No. 78,444

Int. Cl. F16l *33/20*

U.S. Cl. 285—177 4 Claims



Flexible coupling for interconnecting ends of corrugated tubes of different cross-sectional diameters comprises tubular body section with two integral elongate portions having different cross-sectional diameters that correspond to the cross-sectional diameters of the tubes to be connected thereto. In one embodiment, slit in each end portion of tubular body section enables end portions of body section to fit tightly over corrugated tubes to be connected to coupling. In another embodiment, plurality of locking lugs formed in tubular body section at each end thereof project into interior of body section for positioning between corrugations of tubes to be connected thereto.

3,727,954

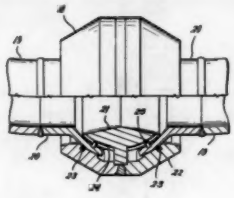
METHOD AND APPARATUS FOR CONNECTING AN UNDERWATER PIPELINE TO A PLATFORM

John P. Oliver, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Aug. 2, 1971, Ser. No. 168,045

Int. Cl. F16l *27/00, 27/04, 1/00*

U.S. Cl. 285—168 1 Claim



A rigid riser pipe section is connected to the end of an underwater pipeline by an articulated pipe section which permits the riser pipe section to be laid with the pipeline along the underwater level and then raised to connection along the length of a supporting leg of a platform.

3,727,955

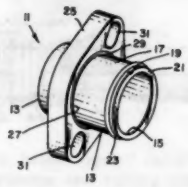
SEMIFLEXIBLE FLUID-TIGHT TUBE COUPLING

Efton T. Carter, 2737 Irwin, Lake Isabella, Calif.

Filed March 22, 1972, Ser. No. 236,949

Int. Cl. F16l *21/00*

U.S. Cl. 285—223 10 Claims



An apertured flange member with a beveled inner edge slidably disposed about a uniform cylindrical surface of a tubular member having an elongated axial bore and a circumferential recess immediately adjacent the tube's end extremity in which recess a resilient sealing ring is seated, and means for moving the flange member toward a second body arrangement to produce a fluid-tight (liquid or gas) communication between the bore and an opening in an end extremity of the second body arrangement by the action of the beveled edge urging only a portion of the sealing ring beyond its seat and toward and contacting the second body arrangement, whereby the sealing ring is compressed into an inescapable cavity formed by the beveled edge of the flange and the circumferential recess.

3,727,956

DEMOUNTABLE HANDLE ASSEMBLY

Samuel J. Popell, Chicago, Ill., assignor to Popell Brothers, Inc., Chicago, Ill.

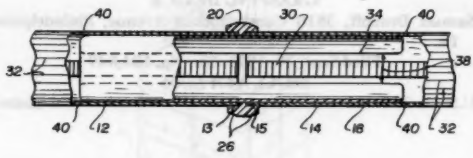
Filed Sept. 7, 1971, Ser. No. 178,348

Int. Cl. F16b *7/00;* B25g *3/12*

U.S. Cl. 287—2 13 Claims

A demountable, lightweight, tubular appliance handle is shown, having two or more tubular sections. The tubular sec-

tions are interfitted by a C-shaped elongate spring connector normally press-fitted in one of the tubular sections to a point approximately one-half the length of the connector member to accomodate the next adjacent tubular section for slidable mounting on the exposed end of the spring connector member. A collar is slidably disposed adjacent the outer end



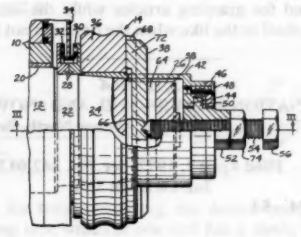
of the spring connector member to provide a wiping action along the exposed end of the connector member as the adjacent tubular section is slidably mounted thereon, such that the tubular section following the wiping action of the collar is more prone to removal than the next adjacent tubular section. The collar retention flange has flanking undercuts to receive the tubular element.

3,727,957

FORMING ROLL

Thomas A. Brown, Greensburg, and Joseph B. Huber, Acme, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Aug. 23, 1971, Ser. No. 173,910
Int. Cl. B60b *27/06*
U.S. Cl. 297—53 R **8 Claims**



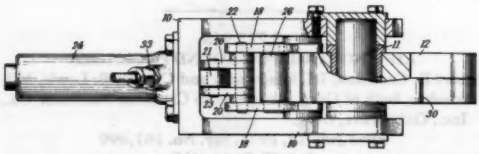
A form roll of hard material, such as cemented tungsten carbide, for example, is mounted on a driving shaft. A bar-like key engages a hole in the shaft and notches in the roll and is engaged by a screw which clamps the key to the roll. A split sleeve is forced between a cylindrical central bore in the roll and a tapered portion on the shaft which the roll surrounds.

3,727,958

SELF-LOCKING COUPLING

Ralph Peters, Wolverhampton, Staffordshire, England, assignor to H. M. Hobson Limited, London, England

Filed Aug. 25, 1971, Ser. No. 174,729
Int. Cl. F16c *11/00*
U.S. Cl. 287—95 **4 Claims**



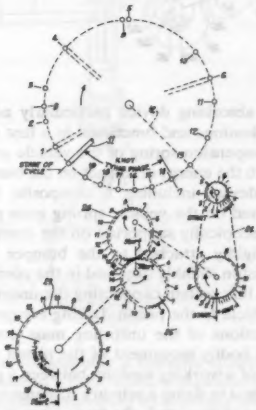
A coupling, arranged to lock automatically, in response to contact with a unit to be coupled, to couple said unit to a unit carrying the coupling, said coupling comprising a frame, a hook pivoted to the frame and spring urged to a free position, and a locking pin urged by another spring into contact with the rear face of the hook when the letter is in its free position and adapted to snap into a recess in the rear face of the hook, upon rotation of the latter into a locking position by contact with the unit to be coupled, to retain the hook in its locking position, the locking pin and the pivot of the hook being aligned, when the hook is in the locking position, with the line of action of the load exerted by or on the coupled unit.

3,727,959

ELLIPTICAL GEAR DRIVE FOR BUNDLE TYING MACHINE

Robert G. Brown, Glenwood, Md., assignor to B. H. Bunn Company, Alsip, Ill.

Filed Feb. 16, 1972, Ser. No. 226,722
Int. Cl. B65h *69/04*
U.S. Cl. 289—15 **5 Claims**



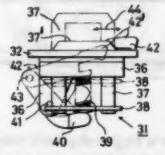
A drive for the twine arm and knotter of a bundle typing machine which uses a continuously connected drive for both the twine arm and knotter. The twine arm, however, is relatively immobile when the knotter is operating and the knotter is relatively immobile when the twine arm is operating. This effect is achieved by connecting the two drives with elliptical gears.

3,727,960

DOOR LOCKING MEANS FOR A VEHICLE

Masao Uemura; Kiyoshi Kumagai, and Satoru Toyama, all of Nagoya, Japan, assignors to Kabushikikaisha Anseikogyo, Nagoya and Mitsubishijidoshakogyo Kabushikikaisha, Tokyo, Japan

Filed Oct. 27, 1971, Ser. No. 192,985
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 **6 Claims**



A door locking means comprising a latching means and a striker cooperative therewith including a striker rod usually

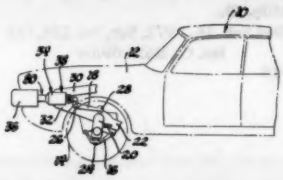
retracted behind a base plate structure by means of a spring, a movable lever partly projecting through said base plate structure to be abutted by an abutting member of said latching means and a striker rod depressing lever pivoted on said base plate structure and pivotally connected to said movable lever.

3,727,961

FLUID SHOCK ABSORBING BUMPER ASSEMBLY

Horacio Shakespear, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1971, Ser. No. 207,113
Int. Cl. B60r *19/06*; B61f *19/04*; F16c *9/06*
U.S. Cl. 293—68 **8 Claims**



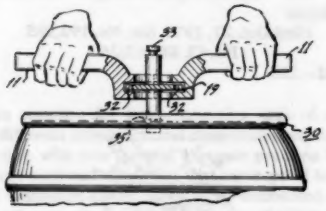
An energy absorbing device particularly adapted for automotive applications and functional in a first mode to damp the primary suspension spring of the vehicle and in a second mode to absorb the energy of impact on the bumper bar of the vehicle, the device including a composite tube assembly rigidly supported on the vehicle sprung mass portion, a support tube telescopically supported on the composite tube assembly and rigidly attached to the bumper bar, a double headed free piston slidably disposed in the composite tube assembly, and a link system connecting the unsprung mass portion of the vehicle to the piston. During compression and expansion deflections of the unsprung mass portion, the link system effects bodily movement of the piston which initiates throttled flow of a working medium between a pair of variable volume chambers to damp a primary suspension spring. When the bumper bar is impacted, the free piston is held fixed and the support tube collapses to effect throttled flow of the working medium through an orifice which traverses the length of a third chamber thereby to absorb the energy of impact on the bar.

3,727,962

KEG LIFTING DEVICES

James F. Reisinger, 17 Fourth St., East Brunswick, N.J.

Filed Oct. 14, 1970, Ser. No. 80,627
Int. Cl. B65g *7/12*
U.S. Cl. 294—16 **4 Claims**



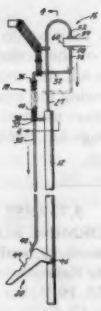
A lifting device for a keg comprises two C-shaped members interpivoted at one end and forming an annular structure in a closed position, said C-shaped members having a groove along the inside surface thereof and entirely about the inside periphery of said structure, said groove adapted to surround and coact with a spout or tap assembly associated with and rigidly fixed to said keg, and handle means extending outwards from said C-shaped members for lifting said keg when said groove is accommodating said spout.

3,727,963

GRASPING DEVICE

Samuel Dranoff, 3810 Conshohocken Avenue, Philadelphia, Pa.

Filed Sept. 29, 1971, Ser. No. 184,849
Int. Cl. A47f *13/06*
U.S. Cl. 294—23 **4 Claims**



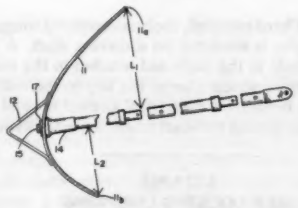
A grasping device having two sets of jaws is disclosed. One of the sets of jaws is open when the other is closed. One set of jaws is used for grasping articles while the other set is for grasping a shelf or the like when the device is not in use.

3,727,964

COMBINATION SNOW SHOVEL AND SNOW PULLER

Donald T. Nordvik, 7549 Noble Avenue North, Brooklyn Park, Minn.

Filed April 7, 1972, Ser. No. 242,013
Int. Cl. E01h *5/02*
U.S. Cl. 294—54 **8 Claims**



A combination snow shovel and snow puller comprising a snow blade having means for receiving a snow shovel handle or a snow puller handle to thereby allow the snow blade to be used either as a snow shovel or as a snow puller for pulling snow off the roof of a building.

3,727,965

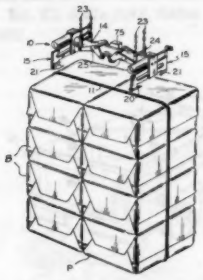
LIFTING TOOL FOR BOUND PACKAGES

Albert E. Cranston, III, Gladstone, and Charles B. Lewis, Milwaukee, both of Oreg., assignors to Cranston Machiner Co., Inc., Oak Grove, Oreg.

Filed July 12, 1971, Ser. No. 161,499
Int. Cl. B66c *1/18*
U.S. Cl. 294—67 R **20 Claims**

A pair of hooking devices is mounted for telescopic extension and retraction in opposite ends of a tubular horizontal

lifting beam. Each hooking device is equipped with a pair of opposed fingers adapted to engage under a binding extending across the top of the package. One of the fingers is a lifting finger and the opposite finger serves as a holding dog to retain the binding on the lifting finger when the two fingers are



closed together. The two hooking devices initially engage the binding at points inward from the opposite sides of the package. Lifting chains connected with pivotal bell crank arms on the beam slide the hooking devices outward from opposite ends of the beam to approach the opposite sides of the package as it is lifted.

3,727,966

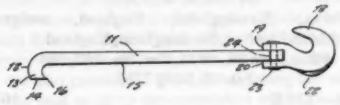
FREIGHT-SKID TOW BAR

Aubrey B. Stockwell, 324 N. Grover, Alma, Mich.

Filed May 12, 1971, Ser. No. 142,692

Int. Cl. B66c *1/00*

U.S. Cl. 294—82 R **1 Claim**



A tow bar for freight skidding, the device comprising an elongated strap iron which at one end has a clevis type hook secured thereto, the opposite end of the tow bar being downwardly turned so to form a biting edge.

3,727,967

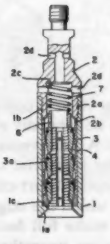
UNIVERSAL OVERSHOT

Eugeniu Vasile Anastasiu, Bucharest; Teodor Gheorghe Balutescu, and Nicolae Stefan Farcas, both of Cimpina, all of Romania, assignors to Institutul De Proiectari Si Cercetari Pentru Utilaj Petrolier, Bucharest, Romania

Filed June 17, 1971, Ser. No. 154,148

Int. Cl. E21b *31/02*

U.S. Cl. 294—86.31 **5 Claims**



A universal overshot or fishing tool (adapted to enter a well or borehole) has a tubular body with a mouth adapted to receive a drill string or sucker rod (fish). A plurality of axially aligned bushings are received in the body and each has an inner wall tapering toward the mouth with a set of slips disposed in each of the bushings. The slips are each longitudinally slidable along and wedgingly engageable between the respective inner wall and the drill string or rod. A spring bearing on a sleeve in turn acting on the set of slips furthest from the mouth (uppermost slip) urges all of the slips axially toward the mouth. The set of slips have increasingly large diameters away from the mouth.

3,727,968

LUMBER GRABBING APPARATUS

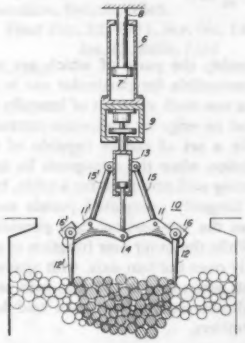
Akira Tsuchihashi, and Kazuo Honma, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 25, 1971, Ser. No. 146,636

Claims priority, application Japan, June 12, 1970, 45/50318

Int. Cl. B66c *1/42*

U.S. Cl. 294—88 **3 Claims**



An apparatus for grabbing a material closely stacked in a compartment such as a hold, which is provided with means for smoothly and easily penetrating its grabbing arms into the interspace of the material so as to enable said grabbing arms to grab a large amount of the material at a time.

3,727,969

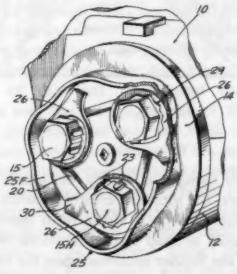
RAILROAD BEARING STRUCTURES

Thomas A. Eddy, Mahwah, and Charles E. White, Franklin Lakes, both of , N.J., assignors to Abex Corporation, New York, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,309

Int. Cl. B60b *35/00*

U.S. Cl. 295—36 R **1 Claim**



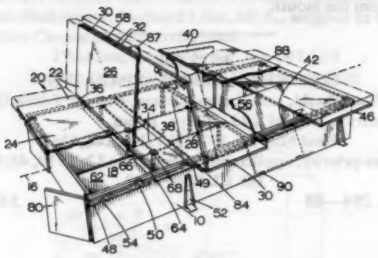
Bolts used to secure the end cap of a bearing structure to the end of a railroad car axle are secured against loosening by the conjoint action of bent tabs on a template and a plurality of lock plates arranged in a unique way to cooperate with a shoulder on the end cap.

3,727,970

CAMPING ASSEMBLIES

Norman E. Delmage, 22 Birchcliffe Avenue, Kitchener, Canada

Filed Feb. 17, 1971, Ser. No. 116,103
Int. Cl. B60p 3/38
U.S. Cl. 296—23 R 6 Claims



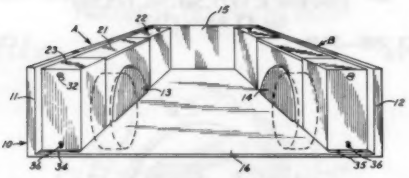
A camping assembly the parts of which are rapidly connectible and disconnectible for particular use in automobile vans is secured to a van deck via a set of laterally related longitudinals supported on edge by transverse connecting members over which lie a set of panels capable of constituting sleeping accomodation when the occupants lie transverse to the van axis, or seating with provision for a table, by lifting two adjacent pairs of hingedly connected panels such that the center pair assumes the sub-vertical thus providing two opposite seat-backs while the outer pair function as seats, all extending transversely over the van axis, with space for a table between two panels when one is slid into said seat position, storage accommodation existing between said longitudinals and connecting members.

3,727,971

UTILITY RECEPTACLE UNITS FOR PICKUP-TYPE VEHICLE BOXES

Melvin L. Sisler, 14470 E. 13th, Space A23, Meadow Mobile Home Park, Aurora, Colo.

Filed March 17, 1971, Ser. No. 125,210
Int. Cl. B62d 33/04
U.S. Cl. 296—37 R 13 Claims



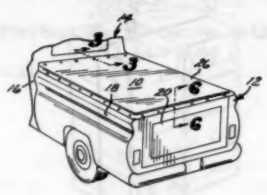
A horizontally elongated, utility receptacle unit, preferably provided in pairs, for location entirely within a pickup box to effectively utilize the space along both inner side walls and over the upwardly arched fender sections while leaving the space between the fender sections open for the full utilization thereof. The receptacle unit may be formed as a main container which may be filled with a particulate weight material such as gravel for increased wheel traction and the main container may have auxiliary containers or container sections at the ends thereof which may contain fluids such as water, gasoline and the like or afford additional storage space.

3,727,972

COVER

Earl H. Belk, 2438 San Francisco Avenue, Long Beach, Calif.

Filed Aug. 20, 1970, Ser. No. 65,474
Int. Cl. B60j 7/10
U.S. Cl. 296—137 R 3 Claims



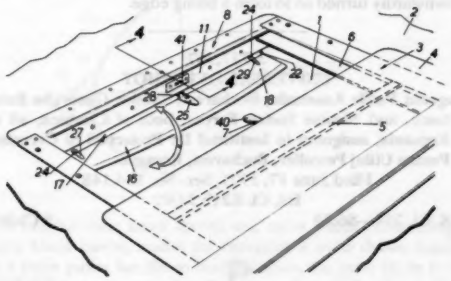
A cover to overlie the open bed of a vehicle afterbody, the cover including a flexible sheet provided in its periphery with a plurality of openings to receive complementally located headed buttons secured about the periphery of the vehicle bed. The cover includes an elongated retainer embedded in the sheet periphery so as to extend across the sheet openings in position to underlie the button heads and thereby secure the cover in position. Use of the retainer enables greater tolerance in the proper locations of the buttons and the sheet openings for receiving them. The retainer also provides a means for attachment of handles to stretch the cover taut.

3,727,973

HINGED DRAUGHT DEFLECTORS FOR VEHICLE OPENING ROOFS

Joseph Perks, Birmingham, England, assignor to Weathershields Limited, Birmingham, England

Filed June 28, 1971, Ser. No. 157,504
Int. Cl. B60j 7/22
U.S. Cl. 296—137 E 10 Claims

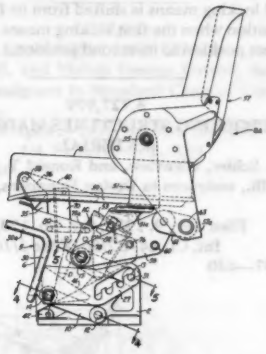


A hinged deflector for a vehicle opening roof comprises a transverse flap adapted to be hingedly connected to the front end of the roof opening. A transverse sealing strip for attachment to the roof at the front end of the opening is provided with a rearwardly disposed part-circular bead having an outer curved surface with which the edge of the flap adjacent to the strip is adapted to make full facial abutment, at least when the flap is in either an operative upwardly and rearwardly inclined position or an inoperative downwardly and forwardly inoperative position.

3,727,974
VEHICLE SEAT HAVING RESILIENT SUSPENSION AND CONSTANT ACTING DAMPING MEANS

Richard F. Swenson, and John J. Gryga, Jr., both of Milwaukee, Wis., assignors to Swenson Corporation, Red Granite, Wis.

Filed Dec. 27, 1971, Ser. No. 212,122
Int. Cl. A47c 3/38; B60n 1/02
U.S. Cl. 297—300 19 Claims

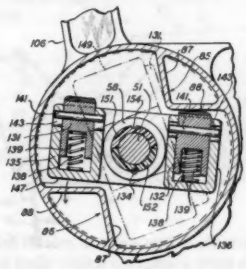


A vehicle seat of the resiliently suspended type for use with earth working or agricultural implements or the like and wherein the seat itself is mounted on a parallel arm linkage arrangement and can be vertically adjusted to different heights. The seat furthermore has an air spring or the like for resiliently suspended the seat for a cushioning effect, which cushioning means can be locked out to provide a solid ride. In addition the seat has a damping means for providing a selectable stiffness or softness of the ride. This damping means is so constructed and arranged that it acts with essentially constant force on the seat regardless of the type of ride selected so that a constant force is applied by the damping means regardless of the vertical position to which the seat bounces or swings. Means are also provided for easily adjusting the vertical position of the seat so as to accommodate operators of different size.

3,727,975
FOLDING STADIUM CHAIR

Paul G. Anderson, 641 A South Indian Hill Boulevard, Claremont, Calif.

Filed June 23, 1971, Ser. No. 155,711
Int. Cl. A47c 1/12
U.S. Cl. 297—332 5 Claims

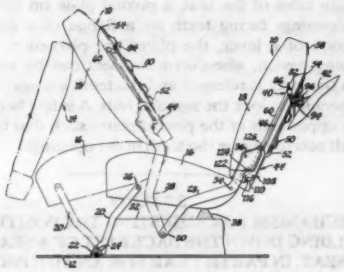


A stadium chair has spaced pairs of vertical side members with attachment means at the bottom of each side member pair for attachment to the riser face or the horizontal platform of the stadium row. The vertical members support pivot plates at the level of the seat. Fiberglass, plastic or cast or forged metal seat surfaces are attached to the pivots. The rear edge of each seat is weighted. Each vertical side member pair has a registry hub that includes a pair of arcuately spaced stops against which resilient locators on the seat register to predetermine occupied and unoccupied seat attitudes. A back rest is attached to spaced support members extending from the vertical side members. Preferably the registry hubs are compound such that side members between adjacent seats accommodate pivots for both seats.

3,727,976
VEHICLE SEAT

Leonard A. Lystad, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1971, Ser. No. 117,649
Int. Cl. B60n 1/04
U.S. Cl. 297—340 6 Claims



A vehicle seat with a conventional seat cushion and seat back includes front and rear links respective each side of the seat with the respective ends of the links pivoted to the seat cushion and a vehicle body floor to mount the seat for bodily movement longitudinally of the vehicle body between a seating position and an easy enter position. A first latch mechanism mounted adjacent the upper edge of the seat back engages a vehicle body mounted keeper to hold the seat in seating position and is selectively actuatable to disengage the keeper and allow movement of the seat to easy enter position. The lower edge of the seat back is pivotally mounted on the rear links for movement about a transverse axis between the generally upright position of the seating position of the seat and a generally horizontal position defining a cargo floor and a cargo position of the seat. A second latch mechanism mounted on the seat back engages one of the rear links to prevent pivotal movement of the seat back to the generally horizontal position during movement of the seat to easy enter position. The second latch mechanism is selectively actuatable to disengage the one rear link as a control rod that extends between the latch mechanisms simultaneously actuates the first latch mechanism to allow the seat back to pivot to the horizontal position. The second latch mechanism subsequently is selectively engageable with the one rear link to maintain the seat back in the horizontal position defining the cargo position of the seat. A pin and slot connection between the first latch mechanism and one end of the control rod allows actuation of the first latch mechanism independently of the second latch mechanism.

3,727,977

ATTACHMENT OF A SAFETY BELT FOR AN ADJUSTABLE SEAT OF A MOTOR VEHICLE

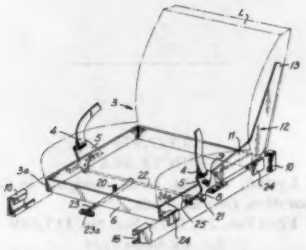
Gunter Gmeiner, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed March 23, 1971, Ser. No. 127,306

Claims priority, application Germany, March 24, 1970, P 20 14 007.2

Int. Cl. A47f 5/00; B60r 21/10

U.S. Cl. 297—344 **10 Claims**



A seat of a motor vehicle is longitudinally displaceable along guide rails at opposite sides of the seat and a clamping device is provided between the seat and guide rails to lock the seat in an adjusted position. The clamping device includes, on opposite sides of the seat, a pivotal plate on the seat frame with openings facing teeth on a flange of a guide rail. By operation of a lever, the plates are pivoted to release the clamping device, whereupon the seat can be adjusted after which the lever is released and the teeth are again engaged in the openings to lock the seat and rails. A safety belt is attached to the upper ends of the pivotal plates such that tensioning of the belt acts to engage the teeth in the openings.

3,727,978

MECHANISM FOR ADJUSTING THE POSITION AND FOLDING DOWN THE BACKREST OF A SEAT AND A SEAT, IN PARTICULAR FOR AN AUTOMOBILE VEHICLE, INCLUDING SAID MECHANISM

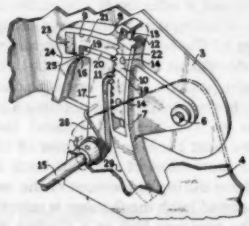
Alain Barriere, Montbeliard, and Gerard Germain, Hericourt, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, both of France

Filed April 11, 1972, Ser. No. 242,936

Claims priority, application France, June 11, 1971, 7121244

Int. Cl. B60n 1/02

U.S. Cl. 297—369 **17 Claims**



A mechanism for adjusting in a given range and maintaining in position a foldable backrest relative to a squab of a seat and for backrest the bakrest out of the range of adjustment. The mechanism comprises an intermediate element relative to which the backrest is movable in a guided manner between two extreme positions of adjustment. The intermediate element is movable in a guided manner relative to the squab between the adjusting position and a position remote from the adjusting position. A first locking means integral with a control means is movable in a guided manner relative to the squab between a first position of locking engagement with the backrest and a second position of locking engagement with the intermediate element, the first locking means having an intermediate position for releasing the backrest ad the intermediate element. A second locking means is movable in a guided manner relative to the intermediate element between a first position of locking engagement with the backrest and a second position for releasing the backrest, the second locking means being co-operative with the first locking means so that the second locking means is shifted from its first position to its second position when the first locking means is shifted from its intermediate position to its second position.

3,727,979

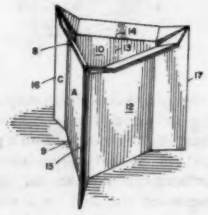
SELF-SUPPORTING STRUCTURES MADE FROM SHEET MATERIAL

Robert W. Schier, Glenview, and Ronald T. Furtak, Chicago, both of Ill., assignors to Design Dynamics, Inc., Northfield, Ill.

Filed Aug. 9, 1971, Ser. No. 170,248

Int. Cl. A47c 7/00; F24c 1/16

U.S. Cl. 297—440 **6 Claims**



Self-supporting structures made from preformed blanks of sheet material and capable of being folded are provided which are useful for portable seating structures, display bins, containers, holders, barbeque grilles, and many other applications.

3,727,980

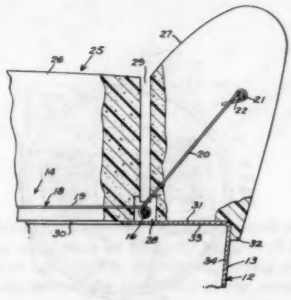
SEAT CONSTRUCTION

Henry J. Tischler, Bloomfield Hills, Mich., assignor to Gulf & Western Metals Forming Company, Southfield, Mich.

Continuation-in-part of Ser. No. 25,832, April 6, 1970, Pat. No. 3,639,002. This application Sept. 16, 1971, Ser. No. 181,041

Int. Cl. A47c 7/02, 27/00

U.S. Cl. 297—452 **10 Claims**



A seat construction comprising a frame including a base and a back. Each of the base and back have a frame with spaced side rails and a spring assembly mounted on the frame. Each

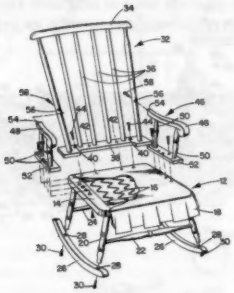
spring assembly comprises a plurality of longitudinally extending wires, a plurality of transversely spaced wires having intermediate portions extending between the spaced wires and free ends extending beyond the longitudinally extending wires at an acute angle to the intermediate portion. Each spring assembly further comprises a longitudinal wire along each side edge connecting the free ends of said transversely spaced wires. Each spring assembly is embedded in a body of resilient foam plastic material.

3,727,981

KNOCKED-DOWN CHAIR

Benjamin Ostroff, and Melvin George Ostroff, both of Gardner, Mass., assignors to Standard Chair of Gardner, Inc., Gardner, Mass.

Filed April 5, 1971, Ser. No. 131,264
Int. Cl. A47c *4/02, 7/54*
U.S. Cl. 297—440 6 Claims



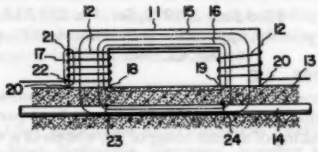
A chair which is shipped disassembled in a small size container and is assembled at destination. The chair has a separate back, arms and seat-leg unit. Optionally, it includes rocking chair runners. The back and arms have cleats fixed to their lower portions which provide a firm foundation and a flush surface to be rigidly fastened to the seat-leg unit. The chair is easily assembled with hand tools and is extremely stable.

3,727,982

METHOD OF ELECTRICALLY DESTROYING CONCRETE AND/OR MORTAR AND DEVICE THEREFOR

Yoshishige Itoh, Kitatamagun, Tokyo; Masatada Kawamura, Hoya-City, Tokyo, and Yoshio Kasai, Funabashi-City, Chiba-prefecture, all of Japan, assignors to Fuji Motors Corporation, Tokyo, Japan

Filed March 8, 1971, Ser. No. 121,710
Claims priority, application Japan, March 20, 1970, 45/23098
Int. Cl. E21c *37/18*; H05b *5/08*
U.S. Cl. 299—14 9 Claims



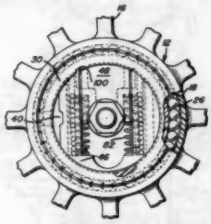
This invention relates to a method of electrically destroying a ferroconcrete body which comprises steps of conducting an alternating magnetic flux generated at an exciting coil to a ferromagnetic material present in the inner part of a ferroconcrete body or conducting an alternating magnetic flux generated at an exciting coil connecting capacitors in parallel to a part or entire part of a coil to said ferromagnetic material thereby to constitute a controlled magnetic induction circuit mainly including said ferromagnetic material and magnetic inductor, and raising the temperature of said ferromagnetic material, and a device therefor.

3,727,983

WHEEL WITH RESILIENT HUB

Raymond B. Leach, Omaha, Nebr., assignor to Miracle Hub and Wheel, Inc., Omaha, Nebr.

Filed Sept. 23, 1970, Ser. No. 74,719
Int. Cl. B60b *9/06*
U.S. Cl. 301—136 8 Claims



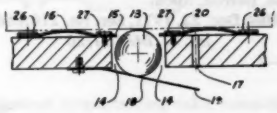
A wheel with a resilient hub in the form of a rotatable annular member journaled on a non-rotatable hub supported from an axle by a resiliently-biased slide member movably guided on the hub by the use of a bearing assembly. The hub includes apertures provided with plugs to provide communication to bearing races formed in the matching surfaces of the hub and annular member to facilitate assembly with the components being constructed of various materials and of various sizes for various uses.

3,727,984

AIR CUSHION CONVEYOR LIFT CELLS

Henry H. Beck, 5 Ark Place., Huntington Station, N.Y.

Filed May 18, 1972, Ser. No. 254,574
Int. Cl. B65g *53/04*
U.S. Cl. 302—29 8 Claims



A pneumatic lift cell for air cushion floors is described in which depression of a spherical valve member by a load is operative to expand an annular diaphram concentrically disposed about the spherical valve member. The resultant lift cell results in a more efficient use of air and permits conveyance of loads having uneven bottom surfaces.

3,727,985

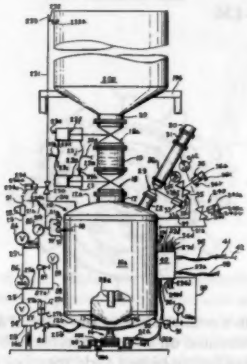
PNEUMATIC CONVEYING APPARATUS AUTOMATICALLY OPERABLE SUCCESSIVELY FOR WEIGHT RESPONSIVE FILLING, AND FOR ACTIVATION, DISCHARGING, PURGING AGAINST BACK PRESSURE, AND VENTING

Brian R. Reuter, Houston, Tex., assignor to Consolidated Engineering Company, Houston, Tex.

Filed Jan. 3, 1972, Ser. No. 214,668
Int. Cl. B65g *53/40*
U.S. Cl. 302—53 6 Claims

The pressure vessel or fluid flow pump cycle of Reuter U.S. Pat. No. 3,355,221, issued Nov. 28, 1967, which has steps of

filling, activation, discharging and purging, is disclosed as load cell or scale supported and vented, and is thus further adapted for lifting certain types of pulverulent material against back pressure, by placing check valve means in the purge line and/or in a pressurized gas line from source, the check valve means being substantially in adjacent communication with the discharge line downstream of the discharge valve. Thus the check valve may close and protect against back pressure urging material, (normally destined to be purged down the discharge line), back into the pressure vessel. The additional



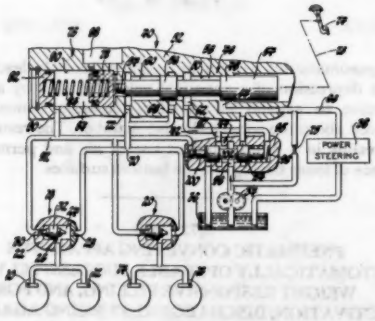
step of venting to atmosphere and/or to hopper any residual material not carried away by the purge step, is thus disclosed as an added step. The admission of pressurized gas from source can enter as when back pressure in some excess may be encountered. As check valves are subject to wear and failure, the employment of pressurized gas from source can act as a safeguard against the effects of back pressure. The added features set forth hereinabove may be employed with a variety of fluid flow pump structures, as agitator equipped pumps; also with pumps suspended below a load cell.

3,727,986

DIRECT APPLY BRAKE SYSTEM

Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1971, Ser. No. 210,666
Int. Cl. B60t *11/20*
U.S. Cl. 303—2 **3 Claims**



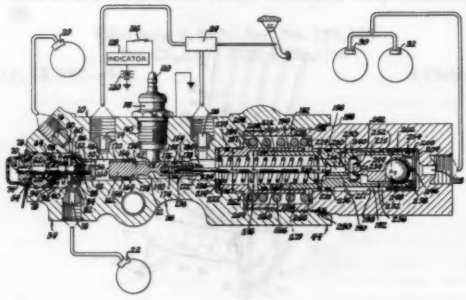
A direct apply brake system includes a control valve which when actuated applies fluid from a central hydraulic source directly to a wheel brake. A master cylinder is mounted in tandem with the direct apply brake control valve and actuated upon over-travel of the valve subsequent to loss of reaction pressure acting on the valve, thereby providing a back-up pressure source. Shuttle valves associated with the wheel brakes selectively connect the brakes to the brake control valve or the master cylinder, whichever is in operation. A shut-off valve blocks communication of the central hydraulic fluid to the brake control valve when the master cylinder is actuated to prevent loss of such fluid in the event of a fluid leak in the direct apply system.

3,727,987

DECELERATION ENERGIZED LOAD CONTROLLED BRAKE VALVE

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 13, 1972, Ser. No. 217,542
Int. Cl. B60t *13/00*
U.S. Cl. 303—6 C **4 Claims**



A combination valve assembly for a dual circuit brake system in which a metering valve is in one circuit, a proportioner is in the other circuit, and a hydraulically reset pressure loss warning indicator unit is sensitive to both circuits. The proportioning action rates change to match vehicle loading, to accommodate uphill and downhill grades, and to accommodate any brake fade. This is accomplished providing a deceleration sensing mechanism which locates the proportioner piston to determine the amount of proportioning required based on the pressure at which deceleration triggers an inertia valve in the proportioner. Actuation of the warning unit because of pressure loss in the metering valve circuit causes the proportioner to be overridden by removing a valve element from a closed position to permit direct flow so that pressure through the proportioner is not proportioned.

3,727,988

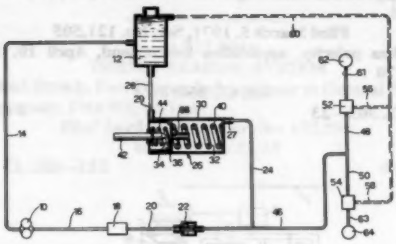
FAILSAFE HYDRAULIC BRAKING APPARATUS FOR MOTOR VEHICLES

Marco Peruglia, Turin, and Giancarlo Michellone, Cambiano, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed June 2, 1972, Ser. No. 259,313
Claims priority, application Italy, June 4, 1971, 68901-A/71
Int. Cl. B60t *13/18*
U.S. Cl. 303—6 C **6 Claims**

The invention relates to an hydraulic anti-skid braking system which will operate to produce at least partial braking, that is braking of at least some of the wheels of a vehicle, even in the event of failure of part of the system causing a loss of pressure in that part. The braking system is normally servo assisted but is arranged to produce braking without servo assistance in the event of a failure of the engine of the vehicle or the pump which produces the servo assistance. The braking circuit is formed in two independent parts each of which comprises a loop around which fluid is continuously circulated by a pump driven by the engine, the pressure of fluid in the loop is controlled by a modulator valve which is closed when the

brakes are operated, to increase the pressure and operate braking actuators which are either in series in the loop or in static branches of the circuit communicating with the loop. A



pressure sensitive valve is provided to ensure that fluid always flows in the correct direction around the loop even in the vent of a failure causing an adverse pressure differential.

3,727,989

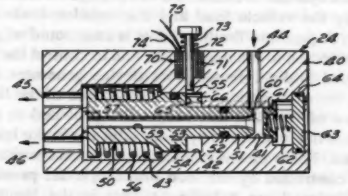
EMERGENCY BYPASS FOR BRAKE PRESSURE CONTROL

Frederick D. Keady, Arlington, Mass., assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 16, 1972, Ser. No. 226,907

Int. Cl. B60t *8/26*

U.S. Cl. 303—6 C **11 Claims**



A motor vehicle dual hydraulic brake system is disclosed having a front brake circuit and a rear brake circuit. A warning switch actuates an alarm device in response to a pressure failure in one of the circuits. A pressure modulating valve in the rear circuit maintains increases in rear brake pressure less than increases in front brake pressure when the front brake pressure exceeds a predetermined pressure. The warning switch is disposed forwardly of the fire wall of the motor vehicle and includes two front circuit outlet ports for supplying fluid pressure to the two front brakes. The pressure modulating valve is disposed adjacent the rear axle of the motor vehicle and includes two outlet ports for supplying fluid pressure to the two rear wheel brakes. An emergency control means which includes a solenoid is operable by the warning switch to render the pressure modulating valve inoperable in the event of a fluid pressure failure in the front circuit.

3,727,990

HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

Hans Josef Vogt, Vallendar, Germany, assignor to Girling Limited, Birmingham, England

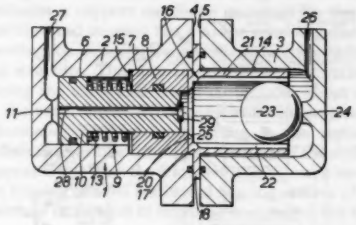
Filed March 1, 1972, Ser. No. 230,750

Claims priority, application Great Britain, March 19, 1971, 7,445/71

Int. Cl. B60t *8/14*

U.S. Cl. 303—6 C **6 Claims**

A brake control unit for incorporation between an hydraulic master cylinder and a wheel brake actuator comprising an inertia-controlled valve member which is movable into engagement with a seating to cut-off communication between an inlet for connection to the master cylinder and an outlet for connection to the hydraulic actuator when the deceleration of the vehicle in which the unit is incorporated exceeds a



predetermined value. The valve seating is movable between a first inoperative retracted position and a second operative advanced position, and means are incorporated for preventing the valve member from engagement with the seating unless the seating is in the advanced position.

3,727,991

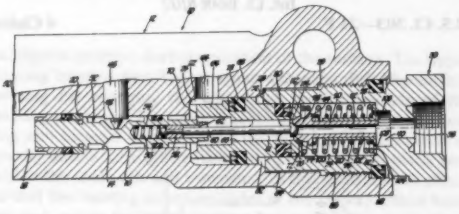
PRESSURE PROPORTIONING CONTROL VALVE

Edward J. DeHoff, and Donald E. Schenk, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 1, 1972, Ser. No. 249,314

Int. Cl. B60t *8/26, 11/34, 17/22*

U.S. Cl. 303—6 C **2 Claims**



A brake pressure proportioning valve assembly with an annular proportioning piston and valve cooperating with an annular valve seat, the outer periphery of the valve seat being a portion of the proportioning valve, and the inner periphery of the annular valve seat having a check valve control mechanism actuated to open either by differential pressure upon brake release or by pressure loss in another brake circuit so as to bypass the proportioner valve elements.

3,727,992

ANTI-LOCK BRAKE CONTROL SYSTEM

Lauren L. Bowler, Bloomfield Hills, and John L. Harned, Grosse Pointe Woods, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

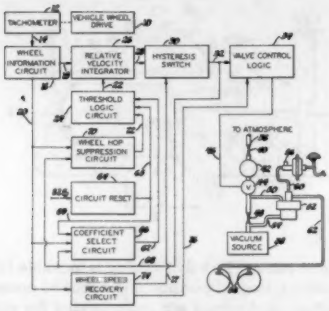
Filed March 15, 1971, Ser. No. 124,004

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 P **1 Claim**

An anti-lock brake control system has a brake pressure modulator operated by a single solenoid controlled on-off valve which effects brake apply, brake release, and brake pressure hold modes. The hold mode is achieved by dithering the solenoid valve. An electronic circuit responsive to rotation of a braked wheel supplies signals to the solenoid valve to effect the various modes. The circuit includes a wheel speed

recovery circuit for supplying to the valve during wheel recovery an operating signal for dithering the valve at a first



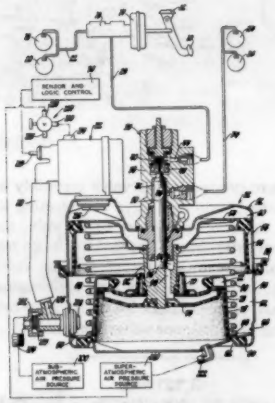
level of wheel acceleration and for producing a brake apply signal above a higher value of wheel acceleration.

3,727,993

WHEEL LOCK CONTROL MODULATOR

Donald E. Schenk, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 13, 1972, Ser. No. 217,543
Int. Cl. B60t *8/02*
U.S. Cl. 303—21 F **4 Claims**



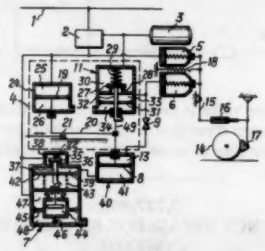
A wheel lock control system in which the brake apply pressure modulator is divided into four chambers, one always subjected to super-atmospheric pressure and normally providing pressure support to the hydraulic displacement piston, one always being subjected to vacuum during operation, and the other two being subjected to vacuum or atmospheric air pressure or super-atmospheric air pressure or some intermediate pressure depending upon the system operational mode to control movement of the brake apply pressure modulating valve displacement piston.

3,727,994

AUTOMATIC LOAD DEPENDENT COMPRESSED AIR BRAKE SYSTEM

Siegfried Keller, Effretikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed March 5, 1971, Ser. No. 121,505
Claims priority, application Switzerland, April 10, 1970, 5328/70
Int. Cl. B60t *8/18*
U.S. Cl. 303—23 **4 Claims**



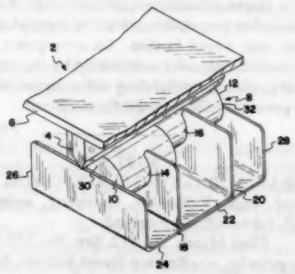
An automatic compressed air brake system for a vehicle the operation of which is dependent on the vehicle load includes brake cylinders for an unladen and for a loaded vehicle connected to a common spring restored actuating linkage. The load brake cylinder is connected to a pressure transmitter controlled by the vehicle load and the unladen brake cylinder pressure. A pressure limiting valve is connected to a control valve connected to the main brake line to control the charging of the load brake cylinder. This device generates an initial pressure for overcoming the restoring force of the linkage irrespective of vehicle load. Means are provided to relax the pressure in the load brake cylinder after the brake has initially responded. These means can exhaust the load brake cylinder and are controlled by the load brake cylinder pressure. The means disclosed are a hollow tappet in the limiting valve which is coupled by a lost motion coupling to a piston subject to the load brake cylinder pressure.

3,727,995

BEARING SYSTEM FOR BALANCE KNIFE EDGES AND SCALE PIVOTS

Werner Russell Ruefenacht, 2650 South West Temple, Salt Lake City, Utah

Filed Sept. 1, 1971, Ser. No. 177,057
Int. Cl. F16c *11/00*
U.S. Cl. 308—2 R **4 Claims**



A bearing system comprising two or more cylindrical bearing members positioned in tandem relation and having the

axes thereof extending parallel to, but offset from, each other for supporting a knife edge or pivot therebetween. Support means for the bearing members is disclosed which permits limited pivotal movement of the bearing members to provide uniform support over the entire length of the knife edge.

3,727,996

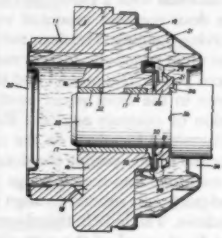
THRUST BEARING SYSTEM

Michael Davich, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed April 20, 1971, Ser. No. 135,581

Int. Cl. F16c *33/66*

U.S. Cl. 308—132 **9 Claims**



A thrust bearing system for use in rotating machines such as electric motors. An end shield is formed with an axially extending hub having a central, axially extending bearing surface and a feed aperture communicating with the bearing surface. A lubricant chamber is formed around the hub and contains a mass of lubricant filled absorbent material with part of the absorbent material extending into the feed aperture. A shaft is rotatably received within the bearing surface. A thrust bearing member is mounted on the shaft and has a thrust bearing surface disposed in a generally radial plane adjacent one end of the hub. A thrust receiving member is positioned in thrust receiving relationship between the thrust bearing surface and the one end of the hub. A retainer is press fit about the outer periphery of the hub and is interconnected with the thrust receiving member to center it about the shaft and restrain it from rotary motion. The retainer includes an outer peripheral flange which engages the absorbent material. The thrust receiving member normally engages the hub only adjacent its outer circumference and flexes into greater engagement with the hub when engaged by the thrust bearing member. The thrust bearing member includes an axially extending ledge which is received within the inner periphery of the thrust receiving member.

3,727,997

SLIDE AND SUPPORT BEARING FOR ROTORS OF LARGE TURBINE MACHINES

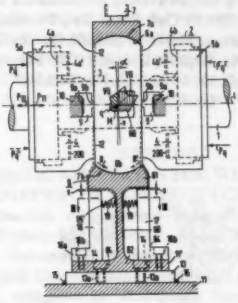
Adolf Brucher, Mulheim-Ruhr; Rudolf Gemein, Duisberg, and Gerold Holzer, Mulheim-Ruhr, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim(Ruhr), Germany

Filed Feb. 1, 9172, Ser. No. 222,570

Int. Cl. F16c *41/02*

U.S. Cl. 308—160 **10 Claims**

A slide bearing in the form of a support pressure-bearing for turbine machine shaft members such as the shaft of a steam turbine rotor or the like, the shaft being aligned in the bearing and having a longitudinal shaft axis disposed in a vertical shart plane. The slide bearing includes shaft collars disposed on the shart, a pedestal, and a bearing housing mounted on the pedestal. The housing has mutually adjacent upper and lower housing parts. A bearing structure is disposed in the housing and has a bearing surface for supporting the shaft in the structure. The bearing structure has axial end faces formed as radially extending bearing surfaces for engaging the collars on the shaft for taking up axial pressure forces of the shart. The bearing structure has an additional bearing surface for laterally supporting the structure in the housing. The lower housing part includes a support cantilever mounted on the pedestal. The cantilevered support has a lower spherical dish-like surface bearing for engaging the additional bearing surface of the bearing structure. The support is resilient in a vertical plane containing the shaft axis and is deflectable about a vertical axis in the vertical plane. The support is dimensioned, so that its deformation-counter force acting in the region of the lower-dish like surface bearing at the start of the deflection of the support is less than the friction force between the dish-like surface bearing and the additional bearing surface of the bearing structure developed in response to a shift of the shaft from its aligned position during operation of the turbine. The upper bearing housing part has an upper spherical dish-like surface bearing for engaging the additional bearing surface of the bearing structure. The support is sufficiently resistant to buckling and to axial compressive load acting in the direction of gravity and is sufficiently resistant to bending in a plane normal to the shaft axis and transverse to the vertical shaft plane, so that the bearing structure slides at the upper surface bearing and moves the lower surface bearing of the cantilevered support when the shaft shifts from its aligned position during operation of the turbine. The cantilevered support deflecting with the shift of the shaft provided the shifting force of the shaft in the region of the lower surface bearing is less than the friction force developed between the lower surface bearing and the additional bearing surface of the bearing structure and greater than the deformation counter force of the cantilevered support.



3,727,998

GAS TURBINE ENGINE

Lionel Haworth, Bristol; Cyril Blea, Chellaston, and Michael Poucher, Duffield, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 19, 1971, Ser. No. 200,394

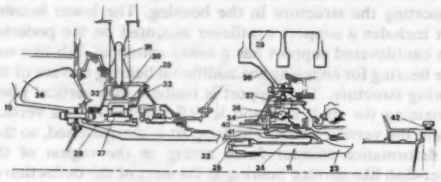
Claims priority, application Great Britain, Nov. 21, 1970, 55,494/70

Int. Cl. F16c *27/06*

U.S. Cl. 308—184 R **16 Claims**

The invention relates to a gas turbine engine in which there is a rotor carried from a shaft, a first bearing supporting the shaft adjacent the rotor, a second bearing supporting the shaft remote from the rotor and a third bearing supporting the shaft at a further distance from the rotor. The first bearing is

mounted so that under conditions of extreme inbalance of the rotor its supporting structure deforms to allow the rotor to in-



vert, and the second bearing is adapted to allow rotation of the shaft during and after the inversion.

3,727,999

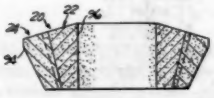
COMPOSITE HEAVY-DUTY BEARING RACE

William M. Dunn, 28639 Oak Point Dr., Farmington, Mich., and Myron C. Sarnes, 20248 Woodhill, Northville, Mich.

Division of Ser. No. 95,299, Dec. 4, 1970. This application March 20, 1972, Ser. No. 235,969

Int. Cl. F16c *33/64*

U.S. Cl. 308—216 **2 Claims**



A composite mechanism element, such as a bevel pinion (FIGS. 1 to 6 inclusive), or the inner race of a tapered roller bearing (FIGS. 7 to 10 inclusive and 16) has its working or load-bearing portion or portions composed of sintered powdered high-performance alloy while its supporting portion not subjected to concentrated or heavy loads, is made of a base metal, such as sintered powdered iron. The toothed outer load-bearing portion of the composite bevel pinion (FIG. 6) and the hollow frusto-conical inner supporting portion (FIGS. 10 to 15) are separately briquetted from high performance alloy powder and low performance metal powder respectively and separately sintered after which the low performance inner supporting portion is pressed into the high performance toothed outer portion so as to be inseparably secured thereto. In the inner race (FIG. 15) of the composite tapered roller bearing (FIG. 16) the low-performance and high-performance portions of the inner race are separately compacted in dies in a briquetting press to form briquettes which are separately sintered and thereafter are pressed together in an assembling operation which causes the high performance and low performance portions of each race to be inseparably secured to one another. The composite outer race is formed by arranging base metal powder and high performance alloy powder in abutting zones in an annular cavity of a briquetting press die and compressing them to form a composite briquette which is then sintered and afterward deformed in a forging die into its final annular shape. The resulting composite sintered powdered mechanism elements are of much lower material cost than corresponding mechanism elements formed of high performance alloy throughout yet perform satisfactorily and have sufficient strength and durability for most purposes. The tapered roller bearing races (FIG. 9) or the bevel pinion (FIG. 15) may be used as they are if of satisfactory density for their intended uses, or they may be further densified by being subjected to an additional hot forging operation with the article sintered thereafter if deemed necessary.

3,728,000

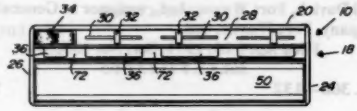
DOOR ASSEMBLY FOR CARTRIDGE TAPE PLAYER

Paul D. McGee, Medinah, and Marcus M. Artner, Chicago, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed March 27, 1972, Ser. No. 238,631

Int. Cl. A47b *81/06*

U.S. Cl. 312—9 **4 Claims**



A door assembly for a cartridge type tape player having a front panel or escutcheon with a cartridge receiving opening therein includes a door member mounted swingably within said cartridge receiving opening. The door member includes a curved end portion upon which the door is mounted for rotation behind the front panel. The curved end is aligned with a plurality of windows in the front panel portion. Indicia, indicating the function of controls adjacent the windows, are provided at predetermined locations on the curved end portion of the door so that upon opening the door in response to the insertion of a cartridge into the cartridge receiving opening, the curved end portion is rotated to align the indicia with corresponding windows. The indicia thereby are made visible to one viewing the front panel of the tape player during the operation thereof.

3,728,001

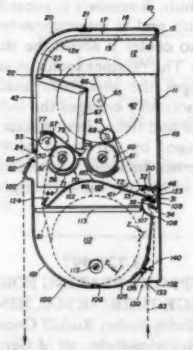
TOWEL DISPENSING CABINET WITH SCRAPER ATTACHMENT

Erwin B. Bahnsen, Oak Brook, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

Filed Jan. 27, 1971, Ser. No. 110,102

Int. Cl. B65h *19/00*

U.S. Cl. 312—38 **16 Claims**



A continuous towel dispensing cabinet includes an open-bottom housing having associated therewith a loop of towel that extends along an exit path to an exposed position accessible to a user and thence along a return path into the housing, an open-top clean towel receptacle mounted in the bottom of the housing and provided with a cover hingedly mounted thereon, dispensing apparatus and soiled towel take-up means mounted in the housing overlying the receptacle for respectively feeding clean towel to the exit path and retracting soiled towel from the return path, guard members for separating the dispensing apparatus and the take-up means from each other

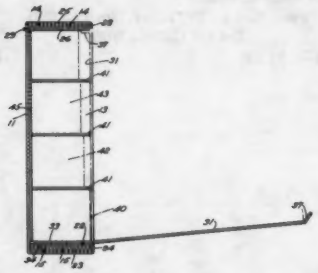
and from the receptacle, first and second scraper members carried by the receptacle adjacent to the open bottom thereof and cooperating to engage and scrape the soiled towel to remove soil particles therefrom, the first scraper member being detachably mounted on the receptacle by means of resilient retaining structure to facilitate cleaning and servicing thereof.

3,728,002

COLLAPSIBLE BOOKCASE

Leo L. Zacks, Barrington, R.I., assignor to Acushnet Van & Storage Inc., Tiverton, R.I.

Filed Nov. 15, 1971, Ser. No. 198,624
Int. Cl. A47b *43/00, 47/00;* **B65b** *5/64*
U.S. Cl. 312—259 **5 Claims**



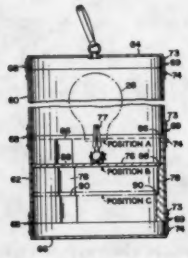
A bookcase formed of cardboard-like material creased and folded to provide top, side and bottom walls with separate front wall and shelves, all held in assembled relation by a tubular member.

3,728,003

SECTIONAL CONVERTIBLE WIG CASE

Philip Bohannon, 2802 West Sitka Street, Tampa, Fla.

Continuation-in-part of Ser. No. 850,982, Aug. 18, 1969, Pat. No. 3,628,655, which is a continuation-in-part of Ser. No. 679,900, Nov. 1, 1967, Pat. No. 3,479,106. This application Oct. 16, 1970, Ser. No. 81,418
Int. Cl. A47b *81/00*
U.S. Cl. 312—285 **6 Claims**



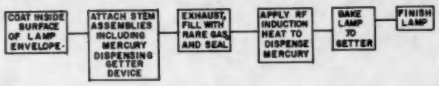
A sectional, convertible wig case for storing and transporting a wig and either a wiglet or fall. The case includes a wig stand having a base which partitions the case into two compartments and which may be supported at various heights within the case. Conveniently, the case is fabricated with removable wall sections such that when only the wig is transported, an upper section of the case may be removed to shorten the case and make it easier to carry. The sections are detachably connected by a hinge-latch combination allowing access to the interior of each section from either side. Each section is also capable of being disassembled into a flat configuration for storage or shipping.

3,728,004

METHOD OF EMPLOYING MERCURY-DISPENSING GETTERS IN FLUORESCENT LAMPS

John F. Waymouth, Marblehead, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 25, 1971, Ser. No. 156,707
Int. Cl. H01j *9/18, 9/38*
U.S. Cl. 316—4 **8 Claims**


COAT INSIDE SURFACE OF LAMP ENVELOPE
ATTACH STEM ASSEMBLIES INCLUDING MERCURY DISPENSING GETTER DEVICE
EXHAUST, FILL WITH RARE GAS, AND SEAL
APPLY RF INDUCTION HEAT TO DISPENSE MERCURY
BAKE LAMP TO GETTER
FINISH LAMP

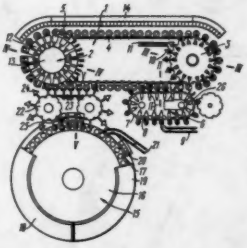
A mercury-dispensing getter device is employed in manufacturing a fluorescent lamp by mounting the device within the sealed lamp envelope, flashing the getter by RF induction heat to dispense the mercury, and baking the lamps within an oven at 250°C for two to five minutes to provide gettering of the released and residual gases in the lamp.

3,728,005

AUTOMATIC APPARATUS FOR WELDING UP AND EVACUATION OF ELECTROVACUUM DEVICES

Albert Ivanovich Alexandrov; Solomon Isaakovich Levin; Valery Fedorovich Chestnov; Raisa Markovna Kovaleva; Tatyana Semenovna Birjukova; Albert Ivanovich Burko, and Mikhail Grigorievich Naumov, all of Saransk, MASSR, U.S.S.R., assignors to Vsesojuzny Navchno-Issledovatelsky Institut Istochnikov Sveta, Saraush, U.S.S.R.

Filed Aug. 26, 1971, Ser. No. 175,093
Int. Cl. H01j *9/48*
U.S. Cl. 316—31 **3 Claims**



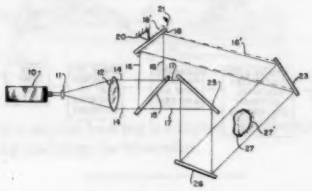
The invention relates to an automatic apparatus for welding up and evacuation of electrovacuum devices, such as incandescant lamps.

The apparatus according to the invention is characterized in that means for welding up component parts of said devices comprises a continuously moving chain conveyor having a chain running around at least two sprockets, the chain of said conveyor supporting stations adapted to hold component parts of said devices, while means for transferring assembled devices from said means for welding up component parts to means for degasification of and filling up said devices with an inert gas also comprises a chain conveyor, the chain of said conveyor supporting means for transferring assembled devices.

3,728,006
HOLOGRAPHIC SCHLIEREN METHOD

Robert E. Brooks, Redondo Beach, and Lee O. Heflinger, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 20, 1971, Ser. No. 190,917
Int. Cl. G01b 9/02
U.S. Cl. 350—3.5 10 Claims

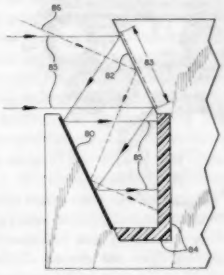


A double exposed hologram is reconstructed by the schlieren method. The hologram of a disturbed and undisturbed scene is twice exposed so that the reference beam forms a different angle with the recording material for each exposure. The recording material has a non-linear characteristic so that intermodulation products of the fringes are generated. The hologram is reconstructed with a reconstruction reference beam. All but a selected diffraction order are eliminated and the selected order is viewed with a knife edge to make visible the phase change of the scene recorded. The reconstruction reference beam must be substantially free of aberrations; otherwise there are no such restrictions on the recording optical elements.

3,728,007
REFLECTIVE TYPE LIQUID CRYSTAL DISPLAY DEVICE HAVING IMPROVED OPTICAL CONTRAST

Karl-Dieter S. Myrenne, and Clarence L. Hedman, Jr., both of Santa Clara, Calif., assignors to SCM Corporation, New York, N.Y.

Filed May 27, 1971, Ser. No. 147,474
Int. Cl. G02f 1/34
U.S. Cl. 350—160 LC 9 Claims



A high contrast reflective liquid crystal display device is disclosed comprising a transparent plate, a mirror disposed in spaced juxtaposition with the transparent plate, a mesomorphic compound confined between the transparent plate and the mirror, and means for establishing electric fields through selected portions of the mesomorphic compound. Ambient light rays impinging on the mirror are reflected along a first path. A light baffle is included which comprises a member located transverse to the first path and providing good light absorption and specular reflection. Reflected light from the mirror which is incident on the member is re-reflected along a second path to another member providing good light absorption and diffuse reflection. The mirror may be planar or serrated.

3,728,008
LIQUID CRYSTAL DISPLAY

Frank V. Allan, New York, N.Y., and Paul Y. Hsieh, Ridgewood, N.J., assignors to Ing. C. Olivetti and Co., S.p.A., Ivrea, Italy

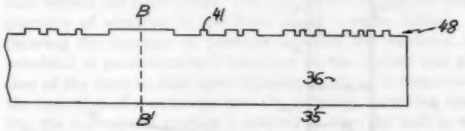
Filed Dec. 1, 1971, Ser. No. 203,884
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 9 Claims

A silane derivative is chemisorbed on the interior surfaces of the substrates of a liquid crystal display to eliminate cloudiness of the display and to increase contrast.

3,728,009
PHASE FILTER COMBINATION WITH LENS OPTICS

Andre Fedotowsky, Cap Rouge, Canada, and Kurt Lehovec, Williamstown, Mass., assignors to Inventors & Investors, Inc., Williamstown, Mass.

Filed Nov. 2, 1971, Ser. No. 194,990
Int. Cl. G02b 27/00
U.S. Cl. 350—162 ZP 11 Claims

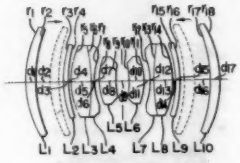


A zonal phase filter is combined with a lens optics to produce a circular image of a point light source. Integration of the phase filter with zone plate optics is described.

3,728,010
VARIABLE-MAGNIFYING-POWER SYMMETRICAL LENS SYSTEM

Nobunao Mikami, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1970, Ser. No. 69,814
Claims priority, application Japan, Sept. 8, 1969, 44/70570
Int. Cl. G02b 15/16
U.S. Cl. 350—184 9 Claims

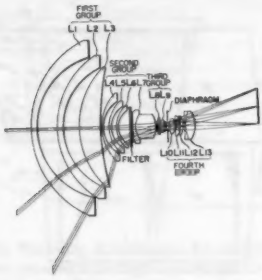


The invention provides a lens system especially adapted for use with photocopying machines, phototypesetters, etc. whose magnifying power may be varied continuously within a range near the unity magnification for example between 0.7 and 1.4. The lens system comprises lenses and lens groups symmetrically arranged with respect to a center stop in such a manner that the outermost lenses (the front and rear lenses) and/or the lens next to the outermost lenses may be shifted toward and away from the stop while maintaining said symmetrical relation. In an embodiment, the magnification is unity when the overall length of the lens system is the longest while the magnification is greater or smaller than unit when the overall length is shorter than the longest one. Aberrations including chromatic aberration are well corrected.

3,728,011
RETROFOCUS TYPE ULTRA-WIDE ANGLE LENS

Ikuo Mori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed March 21, 1972, Ser. No. 236,716
Claims priority, application Japan, March 26, 1971, 46/17297
Int. Cl. G02b 9/64, 13/04
U.S. Cl. 350—214 2 Claims

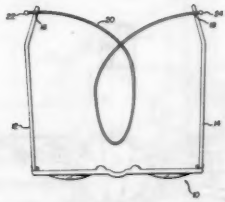


A retrofocus type ultra-wide angle lens, having 13 air-spaced elements in four groups, which include, as viewed from the object side of the lens, a first group consisting of two divergent meniscus elements and a convergent meniscus element, a second group consisting of three divergent meniscus elements and a convergent cemented component, a third group consisting of a divergent meniscus element and a positive cemented component, and a fourth group consisting of a convergent element, a divergent element, a convergent meniscus element and a cemented component. A diaphragm is disposed immediately behind the third group.

3,728,012
EYEGLASSES WITH RETAINER

Dixon P. Downey, 2100 S. Ocean Lane, Fort Lauderdale, Fla.

Filed Dec. 15, 1971, Ser. No. 208,155
Int. Cl. G02c 11/00
U.S. Cl. 351—157 8 Claims

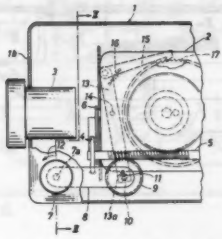


Eyeglasses having a retainer which passes through openings in side portions of the eyeglasses and is adjustable longitudinally to retain the eyeglasses firmly at the eyes of a person are provided with an improved retainer having great springiness and a high coefficient of friction at its surface to cooperate with openings in the side portions of the eyeglasses which are only slightly larger than the diameter of the retainer for receiving the retainer snugly but slidably so that either end of the retainer may be pulled to tighten it on the head of the person. The great springiness and high friction characteristics of the retainer cause it to bind in the openings tending to keep it in the adjusted position. However, the retainer is releaseable for removal from the head of the person. In the preferred embodiment, the retainer is a plastic monofilament strand.

3,728,013
AUXILIARY DRIVE FOR COMPONENTS OF PHOTOGRAPHIC APPARATUS

Friedrich Winkler, and Johann Zanner, Jr., Unterhaching, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 18, 1970, Ser. No. 73,353
Claims priority, application Germany, Sept. 20, 1969, P 19 47 756.6
Int. Cl. G03b 1/00
U.S. Cl. 352—166 9 Claims

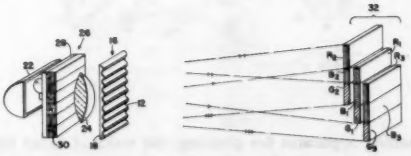


A programming device for the fading means in a motion picture camera can be indexed by the camera motor through the intermediary of an auxiliary drive which can be activated and deactivated at the will of the user. The auxiliary drive receives motion from a worm shaft which is constantly driven by the camera motor, and the auxiliary drive has a single worm gear or a cluster of coaxial worm gears movable into and out of mesh with the worm shaft in response to rotation of a knob, and a power train which indexes the programming device when the motor is on and the worm shaft meshes with the single worm gear or with a selected worm gear of the cluster. The programming device is a ratchet wheel and the power train has a pawl which is biased against the teeth of the ratchet wheel and a crankshaft which rocks a lever serving to transmit motion to the pawl.

3,728,014
APPARATUS FOR PROJECTING A SCENE

William M. Rosenblum, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 761,044, Sept. 20, 1968, abandoned.
This application May 24, 1971, Ser. No. 146,553
Int. Cl. G03b 21/14
U.S. Cl. 353—38 6 Claims

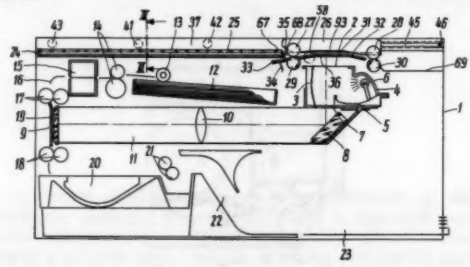


A system and apparatus for projecting scenes upon color additive film. This film is typically configured having a filter screen portion overlaying an image carrying base. The filter screen may be formed as an array of parallel color stripes laid down in a repetitive sequence of colors such as the primaries red, green and blue. A diffraction grating of a phase variety is inserted in the optical path of a projector to cause the projection of zero and first order images of a scene recorded upon the film. The diffraction grating incorporates a surface which is sinusoidal in cross section and is designed so as to cause a replication and mutual displacement of a film image resulting in a blending of the components thereof at a display surface.

3,728,015
COPYING APPARATUS

Egon Opravil, Hamburg-Bergedorf, Germany, assignor to Lumoprint Zindler KG, Hamburg, Germany

Filed May 3, 1971, Ser. No. 139,740
Claims priority, application Germany, May 5, 1970, P 20 21 833.1
Int. Cl. G03g 15/04
U.S. Cl. 355—8 11 Claims

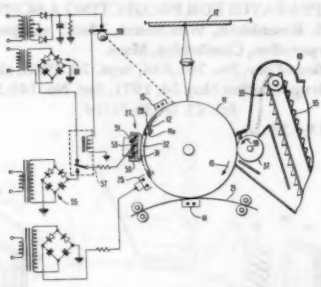


An improved copying apparatus with an exposure orifice on the upper surface of the apparatus and associated with a light source and a receiving surface, alongside which a copying material may be moved. A continuous transport arrangement with an inlet and an outlet slot is provided for foliate originals and a reciprocating transparent mounting for more bulky originals.

3,728,016
CLEANING APPARATUS FOR ELECTROSTATIC COPY DEVICES

Wilmer P. Harbour, Jr., and Carl A. Queener, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,889
Int. Cl. G03g 15/22
U.S. Cl. 355—15 9 Claims

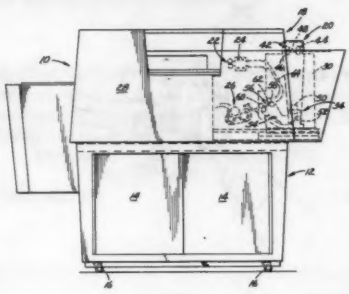


Cleaning apparatus for cleaning the residual toner image from an electrostatic plate of an electrostatic reproduction apparatus incorporates an open celled foam wiper which is mounted for wiping engagement with the plate. The foam wiper is mounted adjacent a conductor which is biased to attract charged toner particles to the wiper as the toner image moves relative therepast. The wiper is periodically cleaned by a serrated or grooved portion of the plate which follows the image and mechanically dislodges toner from the wiper. A reverse bias is applied to the conductor as the serrations on the plate move past the wiper creating a field between the wiper and the plate which repels toner from the wiper to the plate. The toner is carried by the serrations on the plate to the developer unit for use by the electrostatic reproduction apparatus.

3,728,017
SUSPENSION OF OPTICAL SYSTEM

Raymond J. Schmidlin, Lyndhurst, and Richard W. Germuska, Cleveland, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 38,741, May 19, 1970, abandoned.
This application Feb. 14, 1972, Ser. No. 226,336
Int. Cl. G03b 27/00
U.S. Cl. 355—18 5 Claims

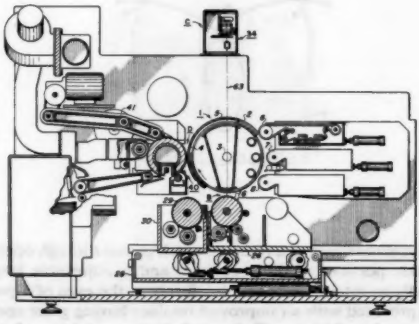


A copy duplicator machine is provided which has an optical apparatus, a sensitizing apparatus, a developing apparatus, and a printing apparatus. A compact rigid support structure mounts the optical apparatus on a larger and less rigid main frame support assembly. A fully yieldably means, preferably tracks, of less rigidity then the support structure, is the only operative interconnection between the main frame assembly and the support structure. Thus, distortional movement of the main frame is not transmitted as torsional movement to the support structure.

3,728,018
IMAGING APPARATUS

Armistead Wharton, Henrietta, and Earl V. Jackson, Penfield, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,847
Int. Cl. G03b 27/46
U.S. Cl. 355—46 1 Claim



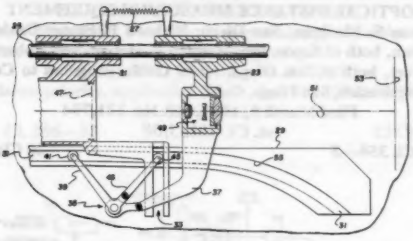
Apparatus having more than one separate object to project along partially separate optical paths having the same image plane for simultaneous superposition of the images of the two objects. The objects are transparencies with one containing the information to be imaged and the other premade to be the border for it. Both objects move in a carriage relative to an exposure slit for simultaneous scanning projection onto a moving member at the image plane.

3,728,019

AUTO-FOCUS PRINTING BELOW 1,1 × MAGNIFICATION

Charles E. Swing, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,745
Int. Cl. G03b 27/36
U.S. Cl. 355—58 **4 Claims**



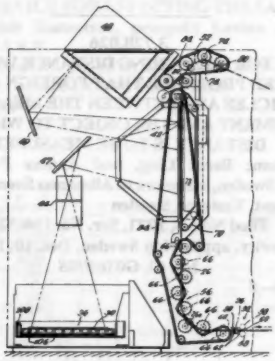
Automatic focusing is achieved for magnification factors ranging from above 1× through and below 1× by a mechanism which positions the negative with respect to the lens for a given magnification. The lens is positioned with respect to the image plane to establish the desired magnification. The negative holder is linked to the lens via a cam and follower which is configured to automatically establish the proper negative to lens spacing to maintain the system in focus.

3,728,020

APPARATUS AND METHOD OF COPYING ON A PLURALITY OF DIVERSE COPY MEDIA

Martin Abrams, Chicago, and Kenneth B. Tafel, Palatine, both of Ill., assignors to AES Technology Systems, Inc., Elk Grove Village, Ill.

Filed Dec. 8, 1970, Ser. No. 96,099
Int. Cl. G03b 27/70
U.S. Cl. 355—66 **24 Claims**



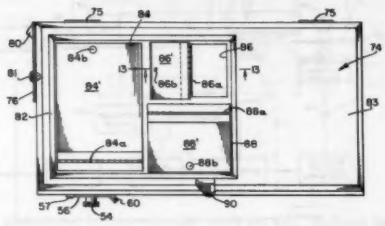
Apparatus and method of copying original documents in which the document to be copied is transported along a document feed path to a position for exposure. Different type copies are produced on diverse copy media, e.g., copy paper and microfilm, simultaneously by exposing the copy media to a focused image of the document and the surrounding field. Plural copies can be made on some media, e.g., copy paper. Typically, the paper copy is of the document and the surrounding field while the microfilm copy is more limited, being primarily of the document. A selected number of different type copies may be produced of each document. The number of paper copies may be different than the number of microfilm copies.

3,728,021

MULTIPLE PRINT EASEL

Rudolph Retzyl, and Martin D. Blanc, both of Chicago, Ill., assignors to Martin Yale Industries, Inc., Chicago, Ill.

Filed Nov. 17, 1971, Ser. No. 199,503
Int. Cl. G03b 27/58
U.S. Cl. 355—74 **10 Claims**



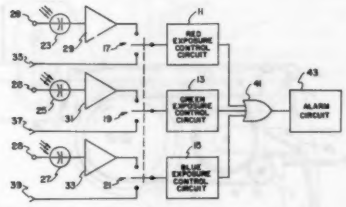
A multiple print easel for printing multiple exposures of both color and black and white in a plurality of different sizes from a single sheet of paper, said easel comprising a base with a paper holder slidably supported on the base, which paper holder retains the paper, a cover supported on the base over the paper holder and said cover provided with a plurality of different size openings each adapted to be separately closed, and wherein the paper holder with the paper may be positioned relative to said openings so that a plurality of prints may be produced from a single sheet, said easel having blocking means whereby the movement and positioning of the paper holder is controlled for proper positioning relative to the cover openings.

3,728,022

DODGING CIRCUITRY FOR PHOTOGRAPHIC PRINTING APPARATUS

Juan Antonio Rodriguez, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1971, Ser. No. 187,477
Int. Cl. G03b 27/76
U.S. Cl. 355—80 **4 Claims**



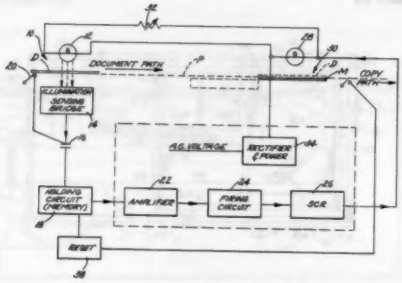
In a photographic printing device, apparatus for extending the exposure time at reduced illumination to thereby provide more dodging time by the apparatus operator. An alarm is activated to warn the operator where one or more corrective filters are about to be inserted in the print beam path, so the operator will be informed that the time to accomplish dodging is ending.

3,728,023

EXPOSURE CONTROL FOR ELECTROSTATIC COPIERS

Phillip J. Stevko, Euclid; Joseph L. Petrella, Cleveland, and Gerald A. Dissauer, South Euclid, all of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Oct. 14, 1971, Ser. No. 189,288
Int. Cl. G03b 27/78
U.S. Cl. 355—83 14 Claims



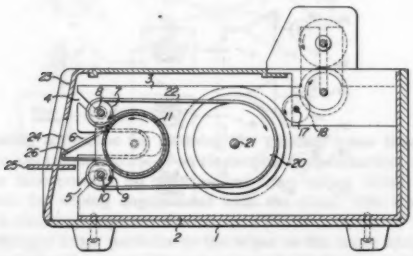
An exposure control for contact copiers wherein an original document is moved on a path of travel first to an illumination intensity measuring and control station and thence to an exposure station. Illumination means are provided to direct a first quantum of light across the path of travel at the measuring and control station and a second quantum of light at the exposure station. Light intensity measuring and control means, including electrical circuitry, are provided at the measuring and control station to sense the intensity of light passing through the original document and change the emitted intensity of the first quantum of light to provide a selected sensed intensity thereof. The emitted intensity of the second quantum of light is also changed directly proportional to the change in the emitted intensity of the first quantum. Means are also provided to maintain the emitted intensities while the original document is transferred from the measuring and control station to the exposure station.

3,728,024

COPYING APPARATUS

Nobuo Nagai, Yamatokoriyama-shi, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Dec. 8, 1971, Ser. No. 205,932
Claims priority, application Japan, May 29, 1971, 46/44298
Int. Cl. G03b 27/10
U.S. Cl. 355—110 4 Claims



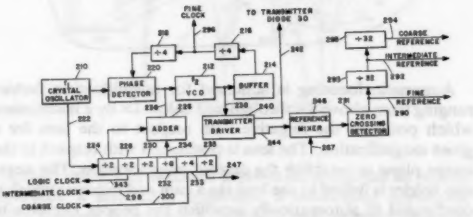
A copying apparatus of the type in which a fluorescent tube lamp is rotated by an endless belt, and a document and a photosensitive copy sheet are passed in superposed relation to each other between the outer peripheral surface of said fluorescent tube lamp and said endless belt, whereby the image on the document is copied on the copy sheet; wherein upper and lower rollers are rotatably mounted with their stub shafts rotatably received in upper and lower slits formed in the opposite side walls of a frame structure, and the fluorescent tube lamp is supported at its opposite ends by bearings slidably received in middle slits formed in said side walls. Each bearing has disposed therein a rotor provided with electrode receiving holes in which the electrodes at each end of the fluorescent tube lamp are received.

3,728,025

OPTICAL DISTANCE MEASURING EQUIPMENT

Thomas S. Madigan, San Diego; Richard F. Stone; David C. Dunn, both of Escondido; William F. Holzer, and Robert H. Sweet, both of San Diego, all of Calif., assignors to Cubic Corporation, San Diego, Calif.

Filed March 8, 1971, Ser. No. 121,794
Int. Cl. G01c 3/08
U.S. Cl. 356—5 20 Claims



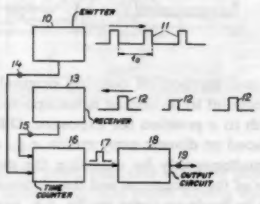
Distance measuring equipment that utilizes a light beam that is intensity modulated by a carrier frequency which is frequency modulated by subcarrier frequencies to provide accurate fine, medium, and coarse distance measurements by detecting the phase shift of these carrier and subcarrier frequencies as a function of distance, and which system includes a cross coupling light transmission means for removing internal delay phase shift error, and that employs a light attenuating device to equalize the intensity of the cross coupling illumination with the return illumination received, and that employs a light transmitter having a substantially planar light source.

3,728,026

MEANS FOR MEASURING DISTANCE WHEN IT IS CONSIDERED PROBABLE THAT FOREIGN OBJECTS OR PARTICLES ARE BETWEEN THE MEASURING INSTRUMENT AND THE OBJECT TO WHICH THE DISTANCE IS TO BE MEASURED

Erik Idestrom; Bernt Ling, and Anders Persson, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Nov. 8, 1971, Ser. No. 196,324
Claims priority, application Sweden, Dec. 10, 1970, 16692/70
Int. Cl. G01c 3/08
U.S. Cl. 356—5 5 Claims



An arrangement for measuring distance under conditions when disturbances of various types may be expected to occur between the measuring instrument and the object to which the distance is to be measured comprises an emitter unit arranged

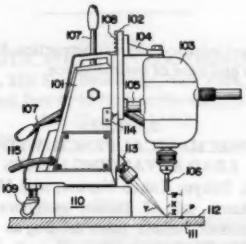
to emit a series of electro-magnetic pulses in the direction of the object and a receiver unit, which only registers the very first echo from each single pulse emitted, and the echo which of all those registered has covered the longest distance is considered to comprise a measurement of the distance to the object in question.

3,728,027

PORTABLE MAGNETIC BORING MACHINE HAVING LIGHT BEAM CENTERING DEVICE

Takashi Watanabe, Naka-ku, Nagoya-shi, Japan, assignor to Nitto Giken Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1971, Ser. No. 105,457
Claims priority, application Japan, Jan. 13, 1970, 45/3644
Int. Cl. G01h *11/26*
U.S. Cl. 356—13 **13 Claims**



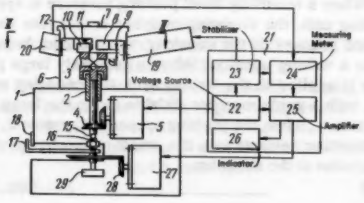
Portable apparatus for centering a boring machine by indicating a position to be perforated by means of projected light, the drill being aligned with the projected light. The apparatus is located relative to the workpiece by a magnetic element carrying the boring device.

3,728,028

METHOD OF DISPERSION ANALYSIS OF SUSPENSIONS AND DEVICE FOR EFFECTING THE SAME

Jury Nikolaevich Kuznetsov, prospekt Levina 55 kv. 45, Yaroslavl, U.S.S.R.

Filed Oct. 30, 1970, Ser. No. 85,483
Int. Cl. G01n *1/00, 33/28*
U.S. Cl. 356—38 **7 Claims**



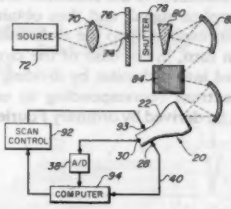
A method of dispersion analysis of a suspension, in which the suspension is distributed on a carrier by means of a scraper, the carrier being continuously moved in one direction relative to the scraper, the dispersion of the suspension is estimated in the method of the invention by the maximum layer of suspension at which a prescribed amount of particles per unit of the layer area project above the layer surface. A device for effecting the above-mentioned method, employs a carrier onto which the suspension is fed the carrier is provided with a drive for rotation of the carrier.

3,728,029

ELECTRO-OPTICAL SPECTROMETER

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Feb. 22, 1971, Ser. No. 117,284
Int. Cl. G01j *3/06*
U.S. Cl. 356—83 **7 Claims**



An electronic image-encoder with an SEC vidicon in which the electron beam is positioned according to a coordinate pair stored as digital signals and applied as analog signals to the deflection coils of the vidicon. This permits the beam to read selected points on the vidicon target and the beam is blanked until the desired deflection signals are applied.

In one version of the device, the deflection signals are simply voltages corresponding to the values of the digital signals. In another version, one digital signal is converted to an analog deflection voltage and a standard ramp is used as the other deflection voltage, the beam being turned on to read only after a time interval following initiation of the ramp, which interval is proportional to the other digital signal.

A special application of the encoder incorporates a crossed-dispersion optical system for projecting several stacked spectral orders into the vidicon target.

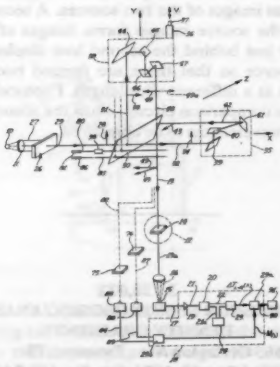
In all cases, the electron beam actuation provides an output signal corresponding to the image intensity at the point selected by the digital signal pair, and this output signal is digitized for storage, manipulation or display.

3,728,030

POLARIZATION INTERFEROMETER

Roland C. Hawes, Monrovia, Calif., assignor to Cary Instruments, Monrovia, Calif.

Filed June 22, 1970, Ser. No. 48,415
Int. Cl. G01b *9/02*; G01r *21/40*
U.S. Cl. 356—106 **24 Claims**



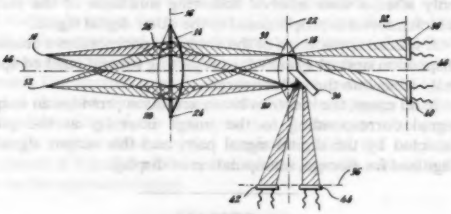
Fourier spectroscopy is used in the measurement of circular dichroism, the method involving the use of an interference polarization modulator which is characterized by production of negligible amplitude modulation in the absence of dichro-

ism in the optical train that follows the modulator and in the detector. Either linear or circular dichroism in that region of the instrument will convert the polarization modulation into amplitude modulation. The polarization modulation is characterized by a different frequency for each wavelength of the radiation, thus the signals caused by the interaction of the radiation with dichroic sample may all be recorded simultaneously and may subsequently be "unscrambled" to derive the inverse Fourier transform of the ensemble of frequencies constituting the complete signal, and thus obtaining a transmission spectrum corresponding to the dichroism. The transmission spectrum in turn, in the case of the circular dichroism, may be converted into dichroism by dividing by the ordinary transmission spectrum (corresponding to ordinary absorption) which may be derived by ordinary Fourier spectroscopy.

3,728,031
MULTICHROMATIC MULTIBEAM ABSORPTION PHOTOMETER

Emmett S. Watson, Jupiter, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Nov. 29, 1971, Ser. No. 202,742
Int. Cl. G01j *3/46*
U.S. Cl. 356—195 **9 Claims**



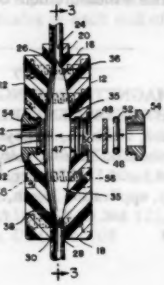
Apparatus for simultaneously and continuously comparing the absorption in two sample cells at two wavelengths. Two adjacent sample cells are illuminated from adjacent sources radiating at different wavelengths. A first lens positioned near the cells forms images of the two sources. A second lens positioned near the source images forms images of the cells. A plane mirror just behind the second lens displaces radiation from one source so that there are formed two sets of cell images, each at a different wavelength. Photocells at the cell images, and a comparison circuit, allow the absorption in both cells at both wavelengths to be compared.

3,728,032
FLOW CELL FOR SPECTROSCOPIC ANALYSIS OF DENSITY GRADIENTS

Hans Noll, 2665 Orrington Ave., Evanston, Ill.

Filed Oct. 13, 1971, Ser. No. 188,746
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **10 Claims**

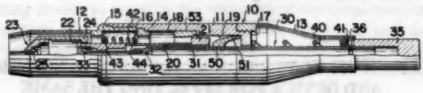
A flow cell having a flow path which is step-free and totally streamlined so that pure laminar flow is achieved therethrough. Analytical resolution and sensitivity is further enhanced by the geometry of the flow path which combines minimal volume with maximal light path. There is likewise disclosed a two part mirror-image construction for reduced cost of manufacture and ease of maintenance.



3,728,033
PUSH-TYPE MECHANICAL PENCIL WITH IMPROVED LEAD ADVANCING MEANS

Sonokichi Seta, Tokyo; Takeo Naruse, and Masahiko Ikawa, both of Saitama, all of Japan, assignors to Dai Nihon Bungu Kabushiki Kaisha (also trading as the Japan Stationery Co., Ltd.), Tokyo, Japan

Filed May 4, 1971, Ser. No. 140,144
Claims priority, application Japan, May 6, 1970, 45/44033; May 6, 1970, 45/44034; May 22, 1970, 45/43345
Int. Cl. B43k *21/16*
U.S. Cl. 401—67 **4 Claims**



A barrel for a push-type mechanical pencil is provided with a large recess and a small recess, with both recesses being defined by a common shoulder. A slidable writing unit within the barrel has an engaging member attached thereto and is contained in the small recess, at its retracted position, by a spring. When a relatively small pushing pressure is applied to the writing unit, the engaging member enters into the large recess and engages to the shoulder, the shoulder being positioned at a writing position. When a relatively large pushing pressure is applied to the writing unit, the engaging member engages with a guide member slidable along the large recess. In such a state, when the pushing pressure is removed, the engaging member retracts into the small recess by leaving the guide member at the shoulder.

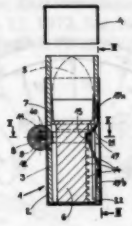
3,728,034
LIPSTICK CASE

Christian Winter, Eschenau/Mfr., Germany, assignor to Robert Huck, Nurnberg and Gunter Rene Evers, Stuttgart, both of Germany

Filed May 11, 1971, Ser. No. 142,829
Claims priority, application Germany, May 13, 1970, P 70 17 807.3
Int. Cl. A45d *40/02*
U.S. Cl. 401—84 **17 Claims**

A lipstick case comprising a container and a seat for a stick of lipstick. The seat can be moved slidingly within the con-

tainer, to present the stick at one end of the container. Inside the container is a spring means which on engagement locks



the seat. Outside the container a driving means can be actuated which then disengages the spring means and moves the seat within the container.

3,728,035

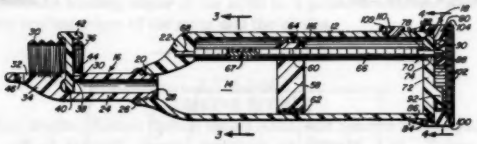
PLASTIC FOUNTAIN TOOTHBRUSH

Jack Reitknecht, 210 East Broadway, New York, N.Y.

Filed Jan. 6, 1972, Ser. No. 215,798

Int. Cl. A46b *11/02*

U.S. Cl. 401—175 **14 Claims**



A plastic fountain toothbrush incorporating an elongated plastic cylinder with a brush head at one end thereof, a piston longitudinally slidably disposed therein for discharging toothpaste through a passageway into the brush head and an operating mechanism for the piston to move it longitudinally at the end of the cylinder remote from the brush head. The entire construction is waterproof to enable the entire device to be easily cleaned or rinsed off with plastic materials being used throughout to enable the device to be economically manufactured. Use of the fountain toothbrush promotes oral hygiene by eliminating transfer of germs from one conventional toothbrush to another by contacting the dispensing portion of a conventional callapsible toothpaste tube with the brush heads of several toothbrushes in a family.

3,728,036

BINDING FOR PERFORATED LEAVES MADE UP OF A SINGLEPLASTIC PIECE

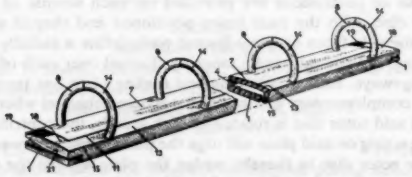
Georges Emanuel Cott, Enghien-les-Bains, France, assignor to Rellure Industrielle S.T.D., Argentheuil, France

Filed Nov. 17, 1970, Ser. No. 90,411

Claims priority, application France, Nov. 18, 1970, 6939668

Int. Cl. B42f *3/04*

U.S. Cl. 402—31 **9 Claims**



A binding for perforated leaves, including a base portion and shutters, opening rings for the perforated leaves formed of a resilient one-piece plastic construction, and reciprocable locking means positioned between the base and shutters and adapted to be actuated for controlled release of the leaves.

3,728,037

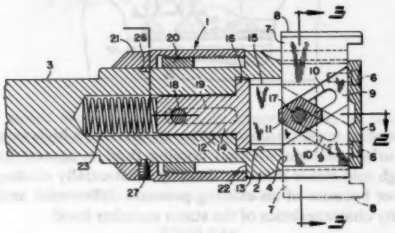
ADJUSTABLE FLOATING REAMER

Milton L. Benjamin, and Wilbur N. Miles, both of Chagrin Falls, Ohio, assignors to Erickson Tool Company, Solon, Ohio

Filed Nov. 4, 1971, Ser. No. 195,608

Int. Cl. B23d *77/04*

U.S. Cl. 408—168 **9 Claims**



An adjustable floating reamer characterized in that a shank member has a slot diametrically thereacross in which overlapping reamer blades are simultaneously adjusted radially outwardly or inwardly by an adjusting sleeve which is rotatable on said shank member and which has threaded engagement with an axially movable cam means engaged with said blades, said adjusting sleeve being spring-biased into frictional engagement with a shoulder on said shank member thus to retain the blade adjustment without additional locking means. Moreover, the present invention is further characterized in that the frictional retaining engagement between the adjusting sleeve and the shank member is increased upon imposition of radial inward load on the reamer blades. Yet another characterizing feature of this invention is the mounting of the blades for radial floating movement about parallel axes which are perpendicular to the slot in which the blades are slidable.

3,728,038

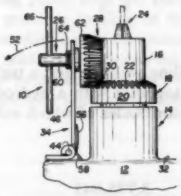
IMPROVED CHUCK KEY AND HOLDER

Arthur A. Gage, 2880 Sylvan Court, Oceanside, N.Y.

Filed Feb. 12, 1971, Ser. No. 114,820

Int. Cl. B23b *39/00*

U.S. Cl. 408—241 **10 Claims**



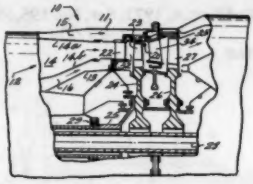
A Jacobs chuck key holder mounted on the hand-drill housing for pivoting movement from an out-of-the-way clearance position into meshing engagement with the Jacobs chuck, either the chuck ring or drill operative end thereafter being rotated relative to the other to cause engagement or disengagement of the drill jaws with the drill bit, and the key lacking, as unnecessary, a centering projection so that no special alignment of the key with the drill operative end is required for the aforesaid meshing engagement.

3,728,039

FLUID COOLED POROUS STATOR STRUCTURE

Larry W. Plemmons, Hamilton, and Charles E. Corrigan, Cincinnati, both of Ohio, assignors to General Electric Company, Lynn, Mass.

Filed Nov. 2, 1966, Ser. No. 591,462
Int. Cl. F01d 5/14
U.S. Cl. 415—115 4 Claims



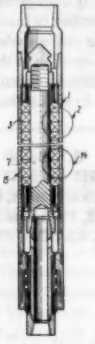
A cooling apparatus for a stator member of a high temperature turbo-machine wherein cooling fluid is caused to pass through said stator member thereby substantially cooling said member because of an existing pressure differential and high porosity characteristics of the stator member itself.

3,728,040

TURBODRILL

Jury Rolenovich Ioanesian, ulitsa Bolshaya Dorogomilovskaya, 58, kv. 56, and Rolen Arsenlevich Ioannesian, naberezhnaya Tarasa Shevchenko, 1/2, kv. 49, both of Moscow, U.S.S.R.

Filed April 22, 1971, Ser. No. 136,525
Int. Cl. F01d 15/12; F03b 3/10; E21b 1/06
U.S. Cl. 415—123 5 Claims



A turbodrill for drilling wells having a turbine for the turbodrill shaft rotation together with a hydrodynamic braking unit, the stator and rotor blades of which extend in the same direction.

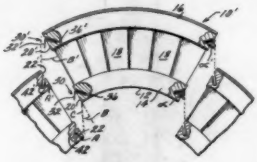
3,728,041

FLUIDIC SEAL FOR SEGMENTED NOZZLE DIAPHRAGM

Richard Edward Bertelson, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Oct. 4, 1971, Ser. No. 186,044
Int. Cl. F01d 1/02, 9/00; F16j 9/16
U.S. Cl. 415—189 8 Claims

In a gas turbine engine, fluidic sealing is provided between the segments of a nozzle diaphragm in a manner that enables both the individual nozzle segments and the seal members to be brought together for joinder from directions that are generally radial in respect to the nozzle axis, thereby permitting assembly in areas where axial movement of the component parts is limited. The invention herein described was



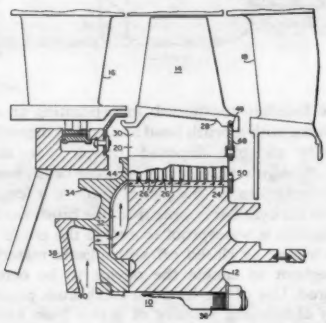
made in the course of or under a contract or subcontract thereunder (or grant) with the Department of the Army.

3,728,042

AXIAL POSITIONER AND SEAL FOR COOLED ROTOR BLADE

Birger O. Hugoson, Wallingford, Pa., and Norbert Vettel, Buergel, Germany, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1971, Ser. No. 175,590
Int. Cl. F02d 5/08
U.S. Cl. 416—95 7 Claims



An axial positioning and sealing means for axially positioning turbine blades with respect to a rotor disc and for sealing the downstream side of cooling fluid flow passageways below the root portions of the blades is disclosed. The periphery of the rotor disc is provided with axial channels for receiving the root portions of turbine blades having radial cooling bores extending from the root portions through the tips of the blades. The channels are formed to provide an axially extending passageway communicating with the cooling bores whereby a cooling fluid flows through the passageway and into the bores to cool the plates. Sideplates means are provided for retaining the blades to the rotor disc.

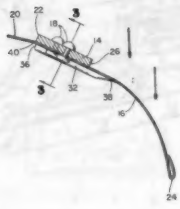
Pads or protrusions are provided on each steeple of the rotor disc, with the pads being positioned and shaped such that the side faces of two adjacent pads define a radially extending, radially outwardly tapering channel over each of the passageways. Each positioning and sealing plate has tapered sides complementary in shape to the tapered channel whereby when said rotor disc is rotated at high speeds, the centrifugal force acting on said plate will urge the plate radially outwardly of the rotor disc to thereby wedge the plate against the pad and the root portion of the turbine blades. Locking means are provided for securing each plate against unlimited radial inward movement with respect to the rotor disc.

3,728,043

FLEXIBLE BLADE FAN WITH RIBBED BLADES

Shrinivas V. Pratinidhi, Chatham, Ontario, Canada, assignor to Fram Corporation, East Providence, R.I.

Filed Jan. 12, 1972, Ser. No. 217,350
Int. Cl. F04d *29/36*
U.S. Cl. 416—132 **15 Claims**



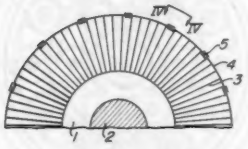
A flexible bladed automotive cooling fan in which the blades are provided with a plurality of radially spaced, transversely extending, raised ribs on the side thereof opposite the arms to which the blades are connected, the ribs extending from the leading edges of the arms to a position intermediate the trailing edges of the arms and the blades.

3,728,044

TURBINE ROTOR

Isao Fujita; Katsuo Daibo; Itsuro Aoki, and Satoshi Ninomiya, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 25, 1971, Ser. No. 156,914
Claims priority, application Japan, June 29, 1970, 45/56035
Int. Cl. F01d *5/22*
U.S. Cl. 416—190 **6 Claims**



For restraining the vibration of turbine rotor blades, a turbine rotor embodying the present invention comprises devices for constituting some pairs of blade groups each composed of a plurality of the turbine rotor blades secured to a bucket cover and for reducing the existence of vibration modes by frictionally linking adjacent blade groups to each other.

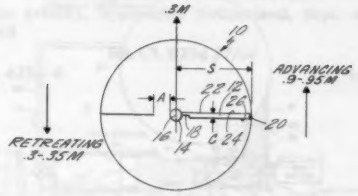
3,728,045

HELICOPTER BLADE

David T. Balch, Monroe, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 22, 1971, Ser. No. 182,777
Int. Cl. B64c *27/46*
U.S. Cl. 416—223 **10 Claims**

To alleviate the roll moment established during helicopter forward flight, it is necessary to vary the blade pitch angle around the azimuth with reduced angle on the advancing side and increased angle on the retreating side. To accomplish this without the introduction of unreasonable losses in lift capability and stability and without an undue increase in drag, the



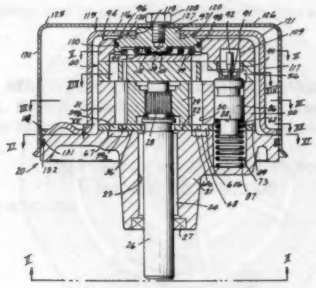
blade airfoil section is selectively shaped so as to delay or minimize blade flow separation, and high Mach number compressibility effects.

3,728,046

POWER STEERING PUMP

Hubert M. Clark, and Gilbert H. Drutchas, both of Birmingham, Mich., assignors to TRW Inc., Cleveland, Ohio

Filed Oct. 6, 1971, Ser. No. 186,865
Int. Cl. F01c *19/08;* **F04c** *27/00;* **F04b** *23/12*
U.S. Cl. 417—79 **8 Claims**



A power steering pump with the flow control valve in the cam and having pressure loading of the stacked pump elements with a controllable area for pressurization and using a drawn steel shell materially reduces the pressurized area acting on the upper pressure plate and hence on the stacked pump elements, thereby permitting selection of an optimized pressure area.

3,728,047

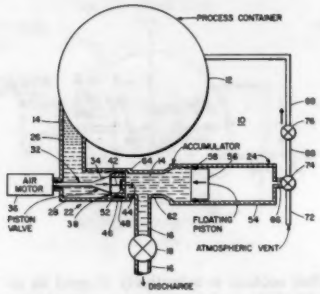
SOLIDS ACCUMULATOR PUMP SYSTEM

John K. Mangialardi, King of Prussia, Pa., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 13, 1971, Ser. No. 179,740
Int. Cl. F04b *19/04*
U.S. Cl. 417—488 **3 Claims**

A solid waste pumping system for use with a process operat-

ing at a vacuum in which a reciprocating pump moves the solid waste into an accumulator having a floating piston. The



piston discharges the waste by exposing the other side of the piston to ambient pressure.

3,728,048

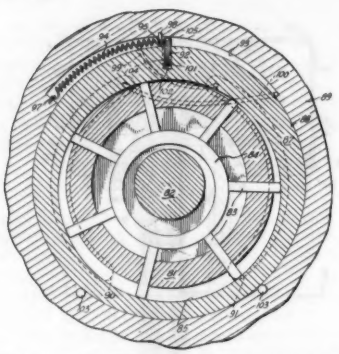
VARIABLE DISPLACEMENT MOTORS

George D. Ratliff, Jr., 2314 Forest Drive, Pittsburgh, Pa.

Filed May 19, 1971, Ser. No. 144,845

Int. Cl. F01c *1/00, 21/16*

U.S. Cl. 418—17 3 Claims



A vane-type motor uses the centrifugal force of the vanes to drag the control ring and control displacement. Reaction torque on the control ring is cancelled by a secondary vane mounted on the control ring and operating in a tapered chamber. The result is a hydrostatic motor which automatically and gradually shifts displacement in response to speed changes but will not respond to pressure changes.

3,728,049

POSITIVE DISPLACEMENT COMPRESSOR/TURBINE

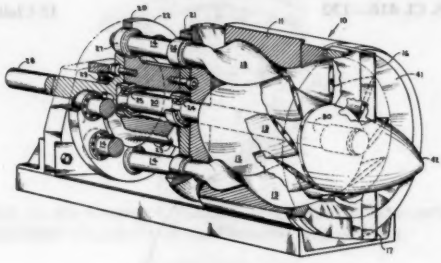
Lloyd E. Miller, Jr., 8330 S.W. 52nd Avenue, Miami, Fla.

Continuation-in-part of Ser. No. 59,248, July 29, 1970, abandoned. This application Nov. 5, 1971, Ser. No. 195,961

Int. Cl. F04c *1/16*; F04d *3/02*; F03c *3/00*

U.S. Cl. 418—55 27 Claims

A positive displacement screw device comprising a pair of housing members in fixed relationship to each other whose adjacent faces are helically threaded but separated to provide passage to and engagement by a plurality of helical rotor blades rotatably supported on a carrier which divide the volume therebetween into expansive pockets, enabling the device to be used as either a fluid pump or motor.



3,728,050

GEARED ENGINE

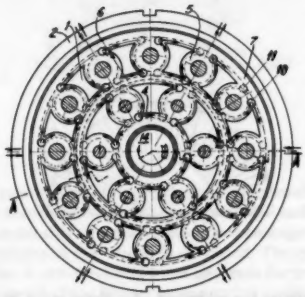
Władysław Wiśniewski; Jan Piotrowski, and Zbigniew Szeler, all of Gdynia, Poland, assignors to Centrum Techniki Okretowej Przedsiebiorstwo Panstwowe Wyodrebnione, Gdansk, Poland

Filed March 26, 1971, Ser. No. 128,368

Claims priority, application Poland, April 4, 1970, P 139729; April 4, 1970, P 139730

Int. Cl. F01c *1/00*; F03c *3/00*; F04c *1/00*

U.S. Cl. 418—165 2 Claims



The invention relates to a geared engine which operates for liquid as well as for gas. If the arrangement is driven by another engine it operates as a gear pump or compressor. The geared engine consists of a central toothed wheel and of toothed wheels engaged with and offset around it, which toothed wheels are encircled by a toothed ring and meshed with it.

The medium flowing through the meshings of the toothed wheels and the central wheel and through the meshings of the wheels and the ring rotates them.

The toothed ring takes over the radial forces arising in the wheel, thus unloading the bearings of the wheels' axes. Depending on the construction of the engine the ring transfers the torque to the central wheel and further to the output shaft or to the casting, which can simultaneously be a winch barrel.

3,728,051

IRON OR STEEL COMPONENTS OF A ROTARY PISTON MACHINE

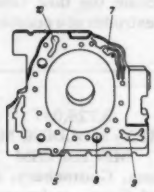
Gerhard Philipp Humbert, Margarethenhoehe, Koenigswinter, Germany

Filed Nov. 16, 1970, Ser. No. 89,589

Claims priority, application Switzerland, Dec. 12, 1969, 18501/69

Int. Cl. B01k *1/00;* **C23c** *11/16*

U.S. Cl. 418—178 **2 Claims**



The friction surface of a cast iron side wall member for a rotary piston engine is hardened by iontriding in an electrical glow discharge in a gas atmosphere containing nitrogen, after coating the areas not be be hardened, to inhibit glow discharge at those areas.

3,728,052

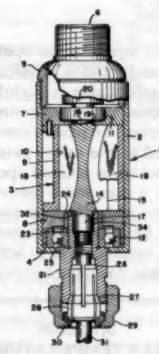
AIR OPERATED TOOL

Philip A. Snider, Hicksville, Ohio, assignor to Dotko, Inc., Hicksville, Ohio

Filed April 16, 1971, Ser. No. 134,587

Int. Cl. F01c *13/00, 21/00;* **B23b** *47/00*

U.S. Cl. 418—181 **6 Claims**



An air operated tool characterized in that the tool chuck thereof has a pilot portion which is coaxial with the air motor rotor onto the shaft of which said chuck is screwed, and which engages a ball bearing in the tool housing so that the chuck and rotor will run true about their common axes despite eccentricity of the chuck threads. Moreover, the pilot portion of the chuck extends axially within the ball bearing thus to increase the effective diameter of the rotor shaft and to shorten the axial overhang of the chuck relative to the ball bearing so as to provide a compact tool in which the accuracy of rotation and strength are enhanced.

3,728,053

APPARATUS FOR THE INJECTION MOLDING OF PLASTIC OBJECTS

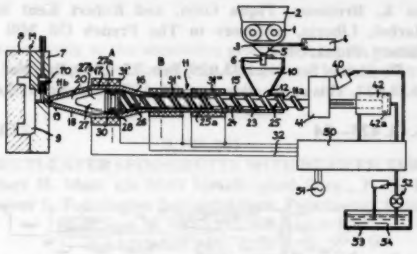
Bruno J. Stillhard, Wildeggstr. 38, 9000 Saint Gallen, and Fredy Z. Scheifele, im Grund, 9244 Niederuzwil, both of Switzerland

Filed Aug. 26, 1970, Ser. No. 67,020

Claims priority, application Switzerland, Sept. 4, 1969, 13407/69

Int. Cl. B29d *27/04*

U.S. Cl. 425—4 **14 Claims**



In the formation of plastic objects having an imporous dense film-like surface enclosing a foam-like porous core, the plastic material and an expanding agent are mixed, heated to a hot plastic compound, and transported through an enclosed axially elongated passageway by a threaded screw member. The threaded screw member is shaped to provide a flow path of variable transverse cross sectional area along its length. By axially displacing the screw member, dosed amounts of hot plastic compound, collected at the outlet end of the passageway, can be extruded for injection into a mold.

3,728,054

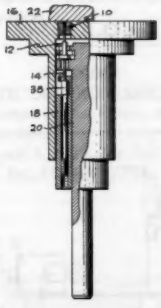
MAGNETIC CORE FORMING APPARATUS

Jack R. Bryant, Freehold Township, N.J., assignor to Electronic Memories and Magnetics Corporation, Los Angeles, Calif.

Filed Dec. 17, 1970, Ser. No. 99,079

Int. Cl. B29f *3/00, 5/00*

U.S. Cl. 425—78 **4 Claims**



Apparatus for forming toroidal magnetic cores by compressing powdered ferrite material, including a punch for compressing the material and a stationary core rod extending through the punch to form the hole of the toroidal core, wherein the punch and core rod are constructed to reduce breakage of the core rod. The punch has a hole with a narrow forward end and a wide rearward end, and the core rod has a narrow forward end that slide through the forward end of the punch hole and a wide rearward portion for moving along the

rearward end of the punch hole. The rearward portion of the core rod is sufficiently smaller than the rearward end of the punch hole to prevent sliding contact with the walls of the punch hole thereof, to eliminate friction therealong as the punch reciprocates. Yet, the diameter of the rearward core rod portion is much larger than the forward core rod portion, to reduce the unsupported length of the forward core rod portion where breakage is likely to occur.

3,728,055

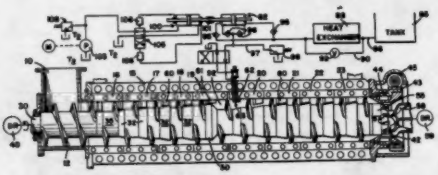
APPARATUS FOR TREATING ELASTOMERIC MATERIALS

Dean K. Bredeson, Piqua Ohio, and Robert Kent Slaby, Harbel, Liberia, assignors to The French Oil Mill Machinery, Piqua, Ohio

Division of Ser. No. 802,029, Feb. 25, 1969, Pat. No. 3,638,921. This application Aug. 31, 1971, Ser. No. 176,610

Int. Cl. B29h *1/10*

U.S. Cl. 425—84 **2 Claims**



Apparatus for adding liquids such as oils to elastomeric materials such as rubber includes a continuous screw press with intermediate chambers where the material is worked under pressure. Liquid is supplied near the center of the chamber through injector bars, and is mixed into the material as it proceeds out of the chamber toward the press exit. The elastomeric materials may be first processed in the press to remove included moisture.

3,728,056

EXTRUDER CONTROL SYSTEM

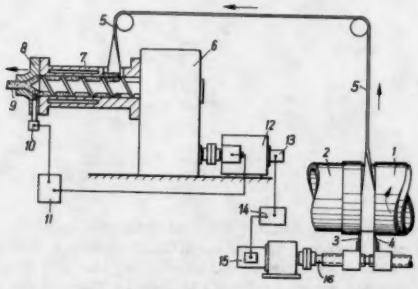
Helmuth Theysohn, Wiehbergstrasse 25C, Hannover, Germany

Filed June 7, 1971, Ser. No. 150,407

Claims priority, application Germany, June 8, 1970, P 20 28 064.2

Int. Cl. B29c *3/06*

U.S. Cl. 425—142 **7 Claims**



A screw type extruder having a rotary extruder screw is provided with a variable speed drive motor for rotationally driving the extruder screw, material feeding means for feeding plasticizable material at a variable flow rate into the extruder, and a control system for controlling both the extruder screw speed and the flow rate of material fed into the extruder. The control system comprises a pressure sensor for sensing the plastic compound pressure within the extruder and a control device for controlling the rotational speed of the extruder screw in dependence upon the sensed pressure to maintain the compound pressure at a constant value. The control system further comprises a speed sensor for sensing the actual rotational speed of the extruder screw and another control device for controlling the volume of the plasticizable material fed into the extruder in dependence upon the sensed extruder screw speed to maintain the flow rate of the plasticizable material fed into the extruder at a constant value.

3,728,057

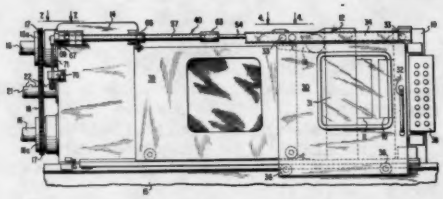
PLASTIC INJECTION MOLDING MACHINE SAFETY MECHANISM

Volker R. Grundmann, Glastonbury, and Larry K. Floyd, Plantsville, both of Conn., assignors to The New Britain Machine Company, New Britain, Conn.

Filed Sept. 2, 1970, Ser. No. 68,853

Int. Cl. B29f *1/100*

U.S. Cl. 425—136 **9 Claims**



In order to prevent injury to the operator, the advance of the movable platen and mold is physically restrained, whenever the windowed safety gate is slightly opened, by a pawl which engages a notched guide bar connected to the movable platen. The movement of the pawl is controlled by a mechanical linkage connected to the safety gate and includes a telescopic torque shaft which is rotated upon opening or closing of the safety gate by a cam and a spherical cam follower associated, respectively, with the gate and the rotatable shaft. Circuitry is provided for detecting an inoperability of the pawl whenever the gate is opened so as to actuate an alarm system and also, if desired, shut down the hydraulic pumps.

3,728,058

PLASTIC MELT TEMPERATURE CONTROL

James E. Wheeler, Roanoke, Va., assignor to General Electric Company, Salem, Va.

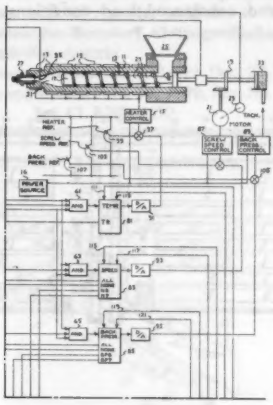
Filed Nov. 1, 1971, Ser. No. 194,233

Int. Cl. B29c *3/02*

U.S. Cl. 425—144 **11 Claims**

A plastic melt temperature control for use with a plastic injection molding machine having a heated barrel, a reciprocating and rotating screw within the barrel and a hydraulic or similar system for applying pressure to the back of the screw, and electrical controls for the barrel heaters, the screw speed and the pressure system provides for the automatic adjustment of the temperature of the plastic. A pulse generator selectively applies pulses to three independent reversing counters, one counter for each of the functions controlled. The contents of each counter is proportional to the quantity of power derived

from a power source to control each of the functions. Logic circuitry provides selective choice of counters the contents of



which are to be increased or decreased in order to change the temperature of the plastic melt when required.

3,728,059

APPARATUS FOR DEFORMING A PLASTIC PIPE

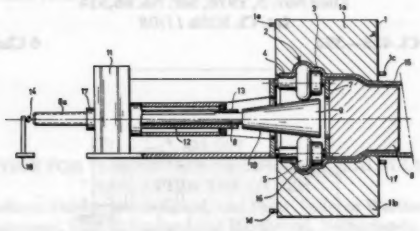
Warner Jan de Putter, Zwolle, Netherlands, assignor to Industriele Anderneming Wavin N.V., Zwolle, Netherlands

Filed Aug. 31, 1970, Ser. No. 68,328

Claims priority, application Netherlands, Sept. 4, 1969, 6913490

Int. Cl. B29c *17/00*

U.S. Cl. 425—155 **5 Claims**



Apparatus and method for providing a thermoplastic pipe with an inner groove, by subjecting a heat plasticized pipe to the action of some rotatably supported rollers which are expanded and rotated by means of a mandril. The assembly of all rollers is caused to move along the inner wall of the plastic pipe in a plane perpendicular to the axis of the pipe.

3,728,060

INJECTION MOLDING MACHINE

Karl Hehl, Siedlung 183, Lossburg, Wurttemberg, Germany

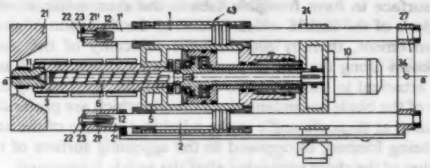
Filed April 14, 1971, Ser. No. 133,828

Claims priority, application Germany, April 24, 1970, P 20 20 060.6

Int. Cl. B28b *17/00*

U.S. Cl. 425—191 **10 Claims**

An injection molding machine having connecting sleeves for the connection of the supporting straps of injection units which operate transverse to and into the separating groove of a casting mold of the molding machine has separate means for securing the supporting struts in their respective connecting sleeves. Each of these means has a threaded bore defined in an end of a strut, and a bore with a shoulder defined in the sleeve, with the shoulder arranged to abut the surface of the strut end. A bolt is in threaded engagement with the threaded bore and in coaxial relationship with the strut. An injection unit operating transversely to the separating groove has a base provided with bearing surfaces for sliding engagement with the top of the machine base.



3,728,061

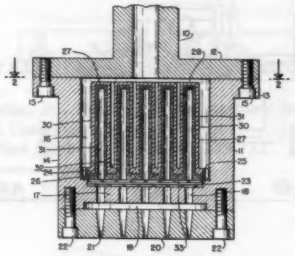
MULTI-LAYER SPINNERETTE WITH HEAD FILTER

Lambert H. Mott, c/o Mott Metallurgical Corp., P. O. Box Drawer L, Farmington Industrial Park, Farmington, Conn.

Filed June 24, 1971, Ser. No. 156,444

Int. Cl. D01d *3/00;* **D29f** *3/00*

U.S. Cl. 425—198 **5 Claims**



The central cavity of a spinnerette head assembly for the extrusion of synthetic polymer filters is substantially filled with tubular filters closed at one end and communicating with extrusion orifices, the filter area being presented to inflowing plastic being at least twice the cross-sectional area of the central cavity, the tubular filter elements having at least an outer layer with a lesser degree of filtration and an inner layer with a greater degree of filtration.

3,728,062

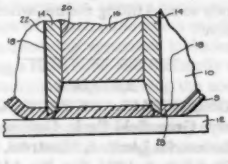
FORMING ARTICLES FROM SHEET MATERIAL

Lee R. Layman, Windsor Locks, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed April 2, 1970, Ser. No. 25,186

Int. Cl. B29c *17/00*

U.S. Cl. 425—291 **2 Claims**



In a trim in place thermoforming process for shaping articles from sheet material wherein a blade penetrates the sheet

around the periphery of each article to facilitate later removal, method and apparatus improvements wherein limited portions of the leading surface of the blade are introduced into the sheet to a lesser extent than that of the remainder of the leading surface to form frangible tabs in the sheet adjacent side portions of the article which extend in the direction of sheet advancement, thereby reducing the criticality of the sheet thickness along the line of penetration for retaining the articles attached to the sheet. To form the tabs, the leading surface of the blade has indentations therein which are preferably oriented at an acute angle to the adjoining surface of the article being formed, as opposed to the adjoining surface of the portion of the sheet remaining after the article is removed.

3,728,063

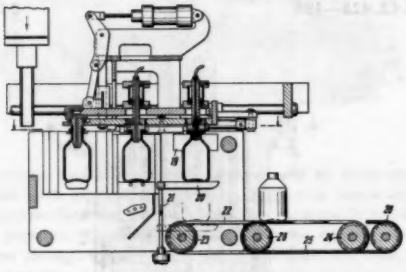
BLOWING MACHINE FOR PRODUCING HOLLOW BODIES, PARTICULARLY BOTTLES

Erhard Langecker, Hohbuschener Weg 5, Meinerzhagen/Westphalia, Germany

Filed April 23, 1971, Ser. No. 136,784

Int. Cl. B29c *5/06, 6/04*

U.S. Cl. 425—326 B **13 Claims**



In apparatus for producing hollow bodies in which a tubular-shaped blank is inflated in a mould within mould closure means alongside an extruder, characterized in that the mould closure means is provided with a blowing mould wherein said blank is inflated, test means for a leakproof test on a hollow body and preferably additional means for filling a satisfactorily tested hollow body, said blowing mould, said test means and said filling means each consisting of two halves, said halves being simultaneously movable between an open position and a closed position by said mould closure means, said blowing mould, said test means and said filling means being at equal distances from one another, and in that carrier means movable in relation to said closure means is provided on a transverse member over said closure means, said carrier means being provided with a blower nozzle a test nozzle and a filling nozzle situated in spaced relationship on the carrier means said spacing corresponding to the spacing of said blowing mould, test means and filling means, said blower nozzle being adapted to move a hollow body from said blowing mould to said test mould and said test nozzle being adapted to transfer a satisfactorily tested body to said filling means, when said halves are in the open position.

3,728,064

CONCRETE PLANK PRODUCTION

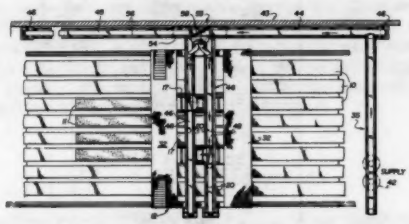
Peter J. Conway, Greenfield Park, Quebec, Canada, assignor to Grayron Industries Limited, Montreal, Quebec, Canada

Filed Feb. 1, 1971, Ser. No. 111,388

Int. Cl. B28b *3/20*

U.S. Cl. 425—376 **5 Claims**

Concrete planks are formed by moving one or more pairs of concrete extruders over a plurality of elongated plank-casting beds. The extruders are suspended from a gantry spanning and movable along the beds. The extruders are symmetrically positioned with respect to each other and the gantry whereby twisting and unbalanced load conditions are substantially



eliminated. Plank lengths are simultaneously formed on beds and following their formation, the extruders are successively positioned over other beds while maintaining the symmetrical balancing of the extruders on the gantry.

3,728,065

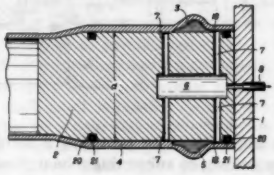
DEVICE FOR THE PRODUCTION OF TUBE SOCKETS

Eduard Figwer, Vienna, Austria, assignor to Inteco Establishment, Vaduz, Liechtenstein

Filed Nov. 3, 1970, Ser. No. 86,514

Int. Cl. B28b *11/08*

U.S. Cl. 425—392 **6 Claims**

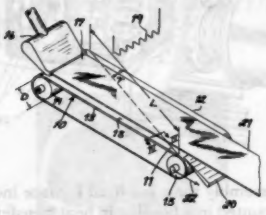


A device for producing tubular sockets provided with an outwardly extending annular enlargement and made of plastic material comprises a removable annular core having a diameter equal to the desired inner diameter of the socket and a ring on said core for forming said enlargement, said ring being removably mounted on said core. The ring is subdivided into at least three segments which are hingedly connected with each other, except that the abutting ends of two segments are bevelled and form sharp points and are merely clamped together, so that after the removal of the core from the socket which has been molded on the combined core and ring, the latter may be collapsed by swinging the segments of the same inwardly about their hinges into bore of the socket and then may be removed from the bore, because the largest dimension of the collapsed ring is smaller than the diameter of the bore in the socket formed by the cylindrical core.

3,728,066
JOINT FOR ENDLESS BELTS

Hubert Stadler, 2560 Berndorf, and Horst Spanyar, A-5280 Braunau am Inn, both of Austria, assignors to Vereinigte Metallwerke Ranshofen-Berndorf Aktiengesellschaft, Braunau-amInn-Ranshofen, Austria

Continuation-in-part of Ser. No. 693,889, Dec. 27, 1967, abandoned. This application Nov. 30, 1970, Ser. No. 93,538
Int. Cl. B28b *1/00*
U.S. Cl. 425—471 6 Claims

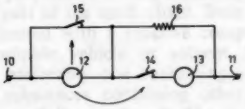


A film-casting belt is composed of flexible metal of high hardness, especially stainless steel but possibly ordinary steel, copper and nickel, and has a thickness up to about 1 mm. The belt joint is made by butt-welding the ends of the band and a bias such that the weld seam runs at an angle to the direction of movement to the belt which ranges between 2° and 45° but preferably is between 2° and 15°. The weld seam is ground flush with the surface of the belt which has a tolerance ± 3 μ. The curvature of the band, which is maintained under tensions up to 200 tons, may be reversed to facilitate stripping of the synthetic-resin or cellulosic film from the surface.

3,728,067
DEVICE FOR FLASHING COMBUSTION FLASH BULBS ONE AFTER THE OTHER

Wilhelmus Polycarpus DeGraaf, and Peter Andreas Waltherus Tielemans, both of Emmasingel Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 23, 1970, Ser. No. 74,811
Claims priority, application Netherlands, Oct. 3, 1969, 6915056
Int. Cl. F21k *5/02*
U.S. Cl. 431—95 1 Claim

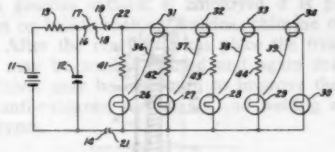


The invention relates to a device for flashing flash bulbs one after the other. In a device according to the invention the flash bulbs are arranged in series, and a bulb is shunted by a make contact which reacts to the radiation heat which is released when said lamp is flashed.

3,728,068
PHOTOFLASH LAMP ARRAY HAVING FLASH-ACTUATED SWITCHES

Paul T. Cote', Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1971, Ser. No. 206,384
Int. Cl. F21k *3/02*
U.S. Cl. 431—95 10 Claims

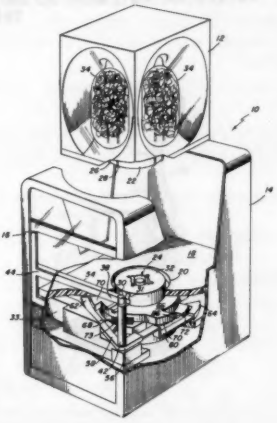


A photoflash lamp array having flash-actuated switches respectively associated with a plurality of the flash lamps and adapted, when the associated lamp is flashed, to connect a next lamp into the electrical flashing circuit. Resistors are respectively connected in series with the plurality of flash lamps and function to insure continued operation of the lash array in the event that a flashed lamp becomes shorted instead of the usual open-circuit condition.

3,728,069
THERMALLY RESPONSIVE FLASH LAMP SEQUENCING APPARATUS

Edward F. Burke, Jr., Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 6, 1971, Ser. No. 159,773
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 35 Claims



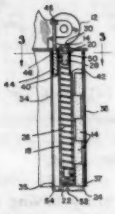
Thermally responsive flash cube sequencing apparatus for use in or with a photographic camera successively advances the component lamps of a flash cube into a predetermined firing position. The sequencing apparatus includes a socket assembly for receiving a flash cube and thermally responsive indexing means for automatically indexing the socket assembly each time a lamp is ignited. The indexing apparatus comprises a pre-stressed thermally expansible sensing element disposed to receive a pulse of thermal energy from an ignited flash lamp. Thermal expansion and subsequent contraction of the sensing element actuates an escapement mechanism which controls the advancement of the socket assembly through four index positions effective to bring the individual flash lamps in the cube successively into the said firing position.

3,728,070

FLINT INJECTION APPARATUS

Virgil O. Rowlett, R.R. 2, Deputy, Ind.

Filed Dec. 2, 1971, Ser. No. 204,087
Int. Cl. F23q 2/38
U.S. Cl. 431—124 7 Claims



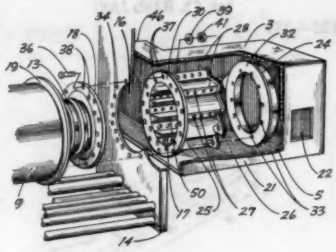
A flint injection apparatus is provided for use with a lighter which utilizes a flint and a flint wheel for ignition. A spring biased plunger is carried in a casing. A trigger having an external portion and a portion slidably carried in an adjacent trigger casing is operatively associated with the plunger. A plurality of flints carried in an adjacent casing will pass, one at a time, through an opening into the plunger casing when the trigger is despressed and the lighter is properly oriented, permitting flints to be easily and rapidly changed.

3,728,071

BURNER ASSEMBLY

Paul A. Mutchler, University City, Mo., assignor to American Air Filter Company, Inc., Louisville, Ky.

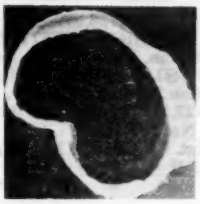
Filed July 10, 1972, Ser. No. 270,157
Int. Cl. F23d 13/40
U.S. Cl. 431—352 2 Claims



A burner assembly for a gas-fired furnace including a heat exchanger mounted in a housing in heat transfer relation with flowing air passing over the heat transfer surface of the heat exchanger, the gas burner assembly including a chamber of serrated cross-section, each serrated cross-section being a generally V-shaped pocket therein whereby fuel enters the chamber parallel to the axis of the chamber and each V-shaped pocket includes two flanks, a first flank having at least one aperture therein for combustion air to enter the chamber tranversely of the fuel passing through each V-shaped pocket, and a second flank having a baffle attached thereto whereby the fuel gas and the air mixing in the pockets are directed tangentially toward the center of the chamber.

CHEMICAL

3,728,072
NOVEL ACRYLONITRILE POLYMER FIBERS AND PROCESS FOR PRODUCING THE SAME
Zen-Ichi Orito, Hiroshi Sugimoto, Minoru Uchida, Hajime Sahara, Masatoshi Takesue, and Kiyoharu Nishida, Nagoya-shi, Aichi-ken, Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan
Filed July 23, 1969, Ser. No. 844,105
Claims priority, application Japan, July 31, 1968, 43/54,103; Nov. 29, 1968, 43/87,438
Int. Cl. D02g *3/02, 3/24;* **D06m** *3/18*
U.S. Cl. 8—115.5 **8 Claims**



An acrylic fiber is provided with protuberances of more than 0.2μ height at intervals in the range of 1.5 to 12μ on the peripheral surface thereof. This novel acrylic fiber is manufactured by treating the fiber with a denaturalizing agent such as alkali metal hydroxides, sulfuric acid, hydroxylamine salts, and hydrazine, and immersing the treated fiber into a shrinking agent such as glycols, hydrotropic agents, metals having a low melting point and organic carbonate or γ-butyrolactone solutions which can dissolve the acrylonitrile polymer.

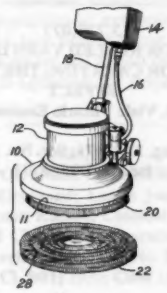
3,728,073
METHOD OF MAKING FLAME RESISTANT TEXTILES BY SUBSTITUTION OF C, H, O BY Mo OR W
Walter G. Pleskun, % David Clark Company Incorporated, 360 Franklin St., Worcester, Mass. 01604
Continuation-in-part of abandoned application Ser. No. 705,001, Feb. 13, 1968. This application May 20, 1971, Ser. No. 145,232
Int. Cl. D06c *7/04;* **D06m** *1/22, 3/28*
U.S. Cl. 8—115.5 **40 Claims**

An initial base material containing carbon and hydrogen atoms, preferably a textile in fiber form is heated with a reacting component containing a metal atom for the purpose of replacing part at least of the carbon and hydrogen atoms to increase the heat resistance and flame proof properties of the base material. The base material is preferably of the nylon type comprising a long chain polymeric amide, hereinafter frequently referred to simply as a polyamide, having recurring amide groups as an integral part of the main chain. Such base material is preferably heated with a reactive component or substance in a suitable vehicle or solvent. Such reactive component is preferably one containing a molybdenum atom though substances containing other metal atoms have been successfully employed. The base material is preferably thoroughly saturated with the reactive component, preferably molybdenum disulphide, in a suitable solvent or vehicle whereby a coating adheres to the base material. The saturated base material is then preferably dried and thereafter passed into a reaction chamber preferably in the presence of a catalyst and subjected to a high temperature which may range from about 600° F. to about 1200° F., preferably between about 700° F. and about 1100° F. and where a gaseous catalyst is employed preferably between about 700° F. and about 900° F. A temperature of about 800° F. has been found suitable for most purposes. The catalyst may be supplied in the saturating bath or when in gaseous form may form part of the atmosphere within the reaction chamber. Where a gaseous catalyst is employed it is preferably a halogen or halide such as fluorine, chlorine or hydrofluoride. After the reaction takes place the treated base material may be washed, rinsed and again dried. Suitable additives may be employed to improve the process such as anti-oxidants, surfactants and wetting agents of various types.

3,728,074
PROCESS FOR THE CLEANSING OF GARMENTS AND TEXTILES
Irving Victor, Minneapolis, Minn., assignor to Research Development Co., Minneapolis, Minn.
Filed June 13, 1961, Ser. No. 116,833
Int. Cl. D06l *1/02, 1/04, 1/10*
U.S. Cl. 8—142 **8 Claims**

A process of drying cleaning textiles and garment materials with compositions including 1,1,2-trichloro-1,2,2-trifluoroethane, trichloromonofluoromethane, and methyl chloroform, wherein the materials are washed and dried at low temperature, together with steps or procedures for the economical handling and recovery of solvent.

3,728,075
METHOD OF SHAMPOOING CARPET ON LOCATION
Bernard M. Cannan, Downers Grove, Ill., assignor to Servicemaster Industries Inc.
Filed Apr. 13, 1971, Ser. No. 133,601
Int. Cl. B08b *1/04;* **A47l** *11/34*
U.S. Cl. 8—147 **10 Claims**



Shampooing pile carpets on-location using mopheads made from a combination of seventy percent nylon, twenty percent cotton and ten percent rayon yarns. The looped yarns are aligned transversely to the direction in which the mop travels. The mop configurations are either circular, for use with rotary carpet shampoo devices or cylindrical for use with revolving drum type shampoo devices. In using either of said devices a liquid detergent in predetermined quantities is applied to the carpet, and the mophead is mechanically moved over the wetted area to shampoo the pile. The resilient nylon fibers sustain the weight of the device and provide an aggressive scrubbing action helping to release the soil from the fibers. The absorbent cellulosic yarns in the mop soak up the soiled liquid detergent.

3,728,076

PROCESS FOR THE HEAT-SETTING OF PADDED AND PRINTED ENDLESS SYNTHETIC FILAMENT GROUPS AND TOP SLIVERS

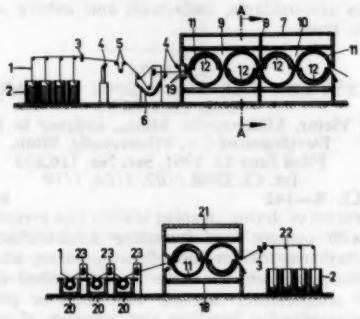
Heinz Fleissner, Egelsbach near Frankfurt Main, Germany, assignor to Vepa AG, Basel/Schweiz, Germany

Continuation-in-part of Ser. Nos. 676,780, Oct. 20, 1967, and Ser. No. 786,042, Dec. 23, 1968, Pat. No. 3,533,145. This application Feb. 6, 1970, Ser. No. 9,386

Claims priority, application Germany, Feb. 6, 1969, P 19 730.8

Int. Cl. D06c *1/08*

U.S. Cl. 8—149.1 11 Claims



The present disclosure is directed to a process for the continuous pad-dyeing or printing of continuous synthetic filament groups with dyestuffs which set under the influence of heat which comprises padding or printing synthetic filament groups with a treatment liquor containing dyestuffs and other auxiliary agents and passing steam which has been superheated to a temperature of about 170° to 230°C through the filament groups.

3,728,077

METHOD FOR REELED YARN DYEING AND APPARATUS FOR CARRYING THE METHOD INTO EFFECT

Giampiero Cadonati, Viale Vittorio Emanuele, 61/B, Bergamo, Italy

Filed Aug. 12, 1971, Ser. No. 171,102

Int. Cl. B05c *8/02*

U.S. Cl. 8—155.1 7 Claims

A method for reeled yarn dyeing as accomplished by operating from inside the yarn winding completely devoid of support, expansion means being provided for producing, upon expansion, individual tight-sealed compartments, in which the dye injectors are accomodated, and apparatus for carrying the method into effect.

3,728,078

TEXTILE DYE CARRIER EMULSIFIER COMPOSITION AND PROCESS FOR DYEING POLYESTERS THEREWITH

Ben N. Freshwater, Chattanooga, and Robert C. Goodrich, Signal Mountain, Tenn., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Oct. 18, 1971, Ser. No. 190,163

Int. Cl. D06p *1/68*

U.S. Cl. 8—174 11 Claims

A liquid dye carrier composition including by weight about 60 to about 100% of a normally liquid alkylated biphenyl, about 40 to 0% biphenyl and about 5 to about 20% of anionic and/or nonionic emulsifiers based on the weight of the alkylated biphenyl. The liquid alkylated biphenyl may be employed alone or as a liquid isomeric mixture in a dye bath for dyeing polyester fibers and other articles having a synthetic polymer or other basis.

3,728,079

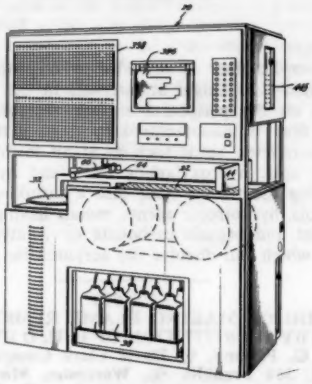
AUTOMATIC CHEMICAL TESTING APPARATUS

John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Original application June 14, 1968, Ser. No. 737,065, now Patent No. 3,622,279. Divided and this application June 21, 1971, Ser. No. 155,152

Int. Cl. G01n *1/14, 33/16*

U.S. Cl. 23—253 R 13 Claims



A discretionary automated chemical testing apparatus for conducting multiple chemical tests on a plurality of samples. A loop conveyor carrying rows of tubes along various stations at which steps in chemical testing is performed with a sample dispensing assembly picking up and dispensing test samples in the tubes, a reagent dispensing assembly metering desired amounts of reagents at the proper stations, heating means at the stations as required for the chemical tests being performed, a testing assembly analyzing the results, tube cleaning and drying means preparing the tubes for reuse, and control means selectively controlling the sequential and multiple analysis.

3,728,080

CONTROL APPARATUS FOR AUTOMATIC CHEMICAL TESTING APPARATUS

John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

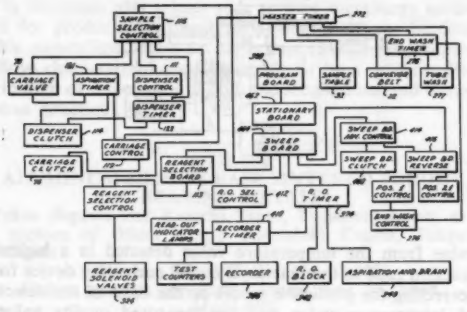
Original application June 14, 1968, Ser. No. 737,065, now Patent No. 3,622,279. Divided and this application June 21, 1971, Ser. No. 155,155

Int. Cl. G01n *1/14, 33/16*

U.S. Cl. 23—259 12 Claims

The improvement in a control apparatus in a chemical testing apparatus in which a plurality of reaction tubes are carried by a loop conveyor sequentially through various positions where samples are dispensed in the reaction

tubes at a first position, reagents are injected into the tubes at predetermined positions, and readout means analyze the contents of the tubes at a predetermined position having a discretionary program selection board with an actuating switch for each tube carried by the conveyor for selectively programming chemical tests to be performed on each sample. A first electrical contact board electrically connected to the program selection board, and a second movable contact board movably indexed relative to the



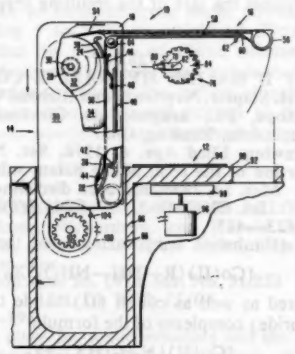
first board as the conveyors index with the second board having contacts electrically connected to and controlling sample dispensing, reagent injecting and the readout means as the second board indexes. A reagent selection board having a plurality of position receptacles corresponding to possible positions for injecting reagents into the tubes and connected to the reagent injecting means and electrically connected to the second movable contact board for actuation as the second board is indexed.

3,728,081

TAPE CARTRIDGE FOR USE IN AUTOMATED SAMPLE ANALYSIS APPARATUS

Edward J. Bidanset, Amawalk, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed July 8, 1971, Ser. No. 160,858
Int. Cl. G01n *31/00*
U.S. Cl. 23—259 **7 Claims**



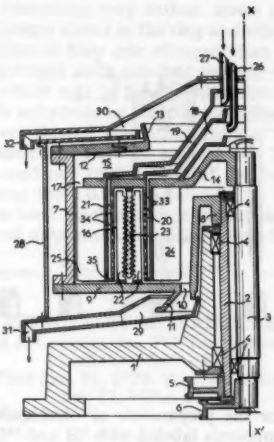
A tape cartridge for use in automated sample analysis apparatus, including a casing having a tape supply portion and a tape take-up portion and permitting the exit from and return of the tape to the casing in a loop in its transport from the supply portion to the take-up portion. An elongated tape platen to longitudinally receive the loop of the tape may be hinged at one end of the platen to the casing to fold and lie along a portion of the casing in a stored position of the platen. The tape platen is swingable outwardly from the casing to an operative projecting position in which it coacts with external apparatus at opposite sides of the platen, the tape being adapted to receive a substance thereon utilized in sample analysis.

3,728,082

APPARATUS FOR LIQUID-LIQUID EXTRACTION

Francois Joseph Henri Hubert Mathieu and Odile Jeanne Marie Mathieu, both of 18 Rue d'Edimbourg, Calais, France

Filed Oct. 29, 1968, Ser. No. 784,273
Claims priority, application France, Oct. 31, 1967, 126,467
Int. Cl. B01d *11/04*
U.S. Cl. 23—269 **2 Claims**



The invention is concerned with a process and apparatus for carrying out liquid-liquid extraction by counterflow contact, wherein the two liquids move in a direction opposite to each other under the action of a centrifugal field and are subjected to agitation for dispersing them in one another.

3,728,083

POLYMER FINISHER

Julius Greenburg, Richmond; Laszlo Joseph Balini, Chester, and William Norman Russell, Colonial Heights, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed March 3, 1971, Ser. No. 120,582
Int. Cl. B01j *1/00*; C08f *1/98*
U.S. Cl. 23—285 **2 Claims**

Apparatus for promoting polymerization reactions such as polyester wherein an inner edge of the rim of a wheel in the

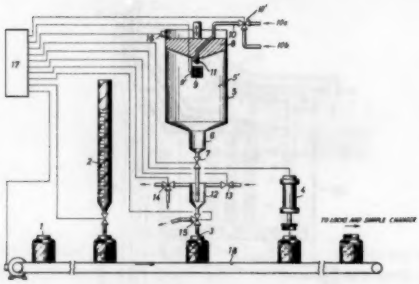
rotating element of the apparatus is left intact in a continuous circle, and projections of specific designs are attached wherein pumping action can be obtained without interfering with the ability of the wheel to film polymer melts up to about 100,000 poises viscosity.

3,728,084

DEVICE FOR PREPARING COMBUSTIBLE SAMPLES CONTAINING COMPOUNDS LABELED WITH ^{3}H AND ^{14}C FOR MEASUREMENT OF THEIR RADIOACTIVITY

Wolfgang Hulsen, Spock, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed June 1, 1970, Ser. No. 42,464
Claims priority, application Germany, May 31, 1969, P 19 27 927.7; May 13, 1970, P 20 23 251.3
Int. Cl. G01n *31/12*; G01t *1/20*; G21h *5/00*
U.S. Cl. 23—253 PC **12 Claims**



A device for the preparation of combustible samples containing compounds labeled with ^{3}H and ^{14}C for measuring their radioactivity in a liquid scintillation counter device. The device includes a transport device which advances any number of flasks into position with respect to a burette, a combustion chamber, and a sealing and numbering device. The flasks receive a charge of scintillator solution from the burette, an absorber solution containing combusted samples from an absorber which is connected by an appropriate valve to the combustion chamber, and a seal from the sealing and numbering device.

The combustion chamber includes a holder for carrying the samples, an electric ignition device and an injection device for flushing the combustion chamber after combustion.

To coordinately control the activity of the various parts of the device a control unit is provided.

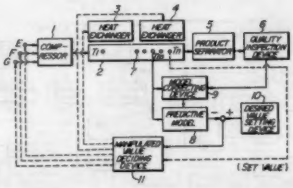
3,728,085

PREDICTIVE CONTROL SYSTEM FOR POLYMERIZING ETHYLENE

Shunichiro Horiguchi, Shunichi Iizuka, and Masato Takami, Tokyo, Naomichi Furutani, Higashi-Murayama, and Koichi Haruna and Tomoo Ishikawa, Kodaira, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Sept. 15, 1970, Ser. No. 72,328
Claims priority, application Japan, Oct. 1, 1969, 44/78,284
Int. Cl. C08f *1/98*
U.S. Cl. 23—284 **2 Claims**

In a tubular ethylene polymerization apparatus in which a mixture of ethylene gas, an initiator, a modifier and other required agents are compressed in a compressor and supplied into a tubular reactor for causing a polymerizing reaction in the reactor under heat exchange and the reaction product is passed through a product separator to separate an ethylene polymer from any unreacted gas, the quality of the ethylene polymer thus obtained being then measured by a quality inspection device, a predictive control system comprising temperature detecting means for detecting the temperature distribution within the reactor, a predictive model for predicting a quality



value from the temperature value detected in a highest reaction zone in the reactor, a model correcting device for correcting the predictive model on the basis of the detected temperature value and the measured quality value, and a manipulated value deciding device for changing one or more manipulated variables controlling the reaction within the reactor depending on the deviation of the predictive quality value from a desired quality value.

3,728,086

METHOD OF PREPARING AMMONIUM PERCHLORATE CRYSTALS OF CONTROLLED SIZE

Arnold Adicoff, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Apr. 17, 1969, Ser. No. 818,184
Int. Cl. C01d *1/30*
U.S. Cl. 23—302 **5 Claims**

A method for preparing uniform well-defined ammonium perchlorate crystals of controlled size which comprises dissolving ammonium perchlorate in an organic solvent and then precipitating in a mixture of an organic solvent and non-solvent for ammonium perchlorate. The ratio of solvent to non-solvent in the precipitating solution determines the size of the resulting crystals.

3,728,087

COBALT II HALIDE HYDRAZINE COMPLEXES

Christian H. Stapfer, Newtown, and Richard W. D'Andrea, New Hope, Pa., assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

No Drawing. Filed Apr. 6, 1970, Ser. No. 26,161
The portion of the term of the patent subsequent to Mar. 14, 1989, has been disclaimed
Int. Cl. C01b *21/00*; C01c *1/00*
U.S. Cl. 423—413 **15 Claims**

Cobalt (II) halide trihydrazinates of the formula

$$[Co(II)(R—NH—NH_2)_3]X_2$$

are prepared as well as cobalt (II) halide tris(hydrazine hydrochloride) complexes of the formula

$$[Co(II)(N_2H_4 \cdot HX)_3]X_2$$

where R is H, alkyl, aryl, haloaryl and X is halogen. The compounds are useful as driers for alkyl resins and to accelerate the oxidative polymerization of olefinic polymer systems, particularly unsaturated polyesters, in conjunction with organic peroxides and as promoters for ketone aldol condensation. Known Co II complexes of the formula $[Co(II)(R—NH—NH_2)_2]X_2$ also have these same uses.

3,728,088

SUPERALLOYS BY POWDER METALLURGY

John Stanwood Benjamin, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 709,700, Mar. 1, 1968, now Patent No. 3,591,362, dated July 6, 1971. This application Aug. 25, 1969, Ser. No. 852,861

Int. Cl. B22f *1/00*

U.S. Cl. 29—182.5 4 Claims

This invention relates to the powder metallurgy of superalloys and, in particular, to dispersion strengthened age hardenable superalloys and wrought products thereof. The invention also relates to a powder metallurgy method for producing wrought metal shapes of age hardenable superalloys, such as dispersion strengthened superalloys characterized metallographically by a uniform distribution of dispersoids in both the longitudinal and transverse directions.

3,728,089

ALUMINUM-SILICON BASE SINTERED POROUS BEARING METALS

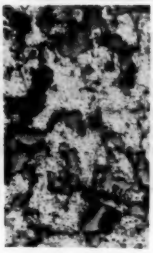
Takeo Segawa and Kenichi Tsuru, Fujisawa, Japan, assignors to Oiless Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1970, Ser. No. 63,429

Claims priority, application Japan, Aug. 22, 1969, 44/66,002

Int. Cl. B22f *1/00*

U.S. Cl. 29—182.5 4 Claims



Aluminum base sintered bearing metals having various advantages can be obtained from metal powders particularly including 5 to 50% by weight of silicon. It has been found that the addition of silicon substantially reduces the tendency of aluminum base metals to cause heat seizure and helps to prevent the surface clogging of the sintered product. Also, the metal mixture to be sintered including silicon powder has an improved compactibility.

3,728,090

SEMICONDUCTOR BONDING ALLOY

Joe G. Hoffman, Richardson, and Donald J. Manus, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 30, 1970, Ser. No. 51,253

Int. Cl. B32b *15/04*

U.S. Cl. 29—195 3 Claims

A bonding alloy for semiconductors and the like comprises a ternary alloy containing aluminum, germanium and zinc. The preferred embodiment of the invention comprises the aluminum-germanium-zinc ternary eutectic alloy which melts at 370° C. and which includes 20 wt. percent aluminum, 23 wt. percent germanium and 57 wt. percent zinc. In the use of the invention, a quantity of aluminum-germanium-zinc alloy material is positioned between a semiconductor device and a device receiving member. The resulting assembly is then heated to above the melting temperature of the alloy material, whereupon the alloy material bonds the semiconductor device to the device receiving member.

3,728,091

DISTILLATE PETROLEUM HYDROCARBON FUEL COMPOSITIONS CONTAINING NOVEL MULTIFUNCTIONAL ADDITIVES

Norman Jacobson and Jack Ryer, East Brunswick, N.J., assignors to Esso Research and Engineering Company

No Drawing. Continuation of abandoned application Ser. No. 739,178, June 24, 1968. This application Oct. 29, 1971, Ser. No. 193,693

Int. Cl. C10l *1/22*

U.S. Cl. 44—63 2 Claims

Distillate petroleum hydrocarbon fuel compositions such as gasolines, jet fuels or diesel fuels are compounded to contain small amounts of at least one amide formed by condensing a basic six-membered heterocyclic organic compound containing only carbon atoms and not more than two nitrogen atoms in the ring and wherein the compound contains at least one nitrogen atom containing at least one hydrogen atom attached thereto, with an acidic compound which may be an aliphatic mono or dicarboxylic acid, its anhydride or the corresponding acid halides or derivatives thereof containing from 6 to 20 carbon atoms per molecule. Between about 5 and 150 pounds of additive is used per 1000 barrels of distillate fuel. Generally between about 0.001 and about 1 wt. percent of the admixture is used. Such additives impart cleanliness, rust inhibiting and detergency properties to the fuels.

3,728,092

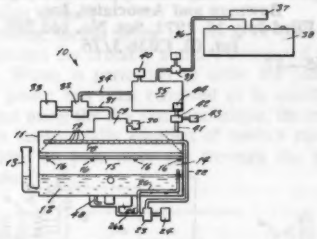
PETROLEUM OIL VAPORIZER

James J. Gorman, Jr., 207 Tanglewood Ave., Charleston, S.C. 29407

Filed Jan. 14, 1971, Ser. No. 106,407

Int. Cl. F02m *31/12*

U.S. Cl. 48—102 R 4 Claims



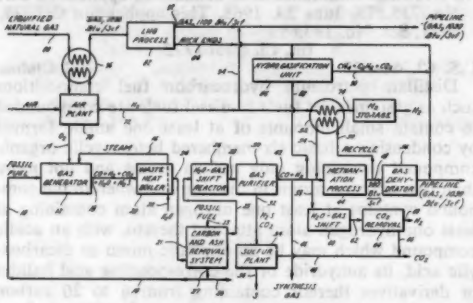
A device for producing vapor from a petroleum product such as gasoline or the like, the device comprising a compressed vapor tank which intercepts a vapor line between a gasoline tank and either a fuel injection system or a carburetor of a gasoline engine, the gasoline tank in the present invention having a lower section for liquid gasoline above which there is a vaporizing space and a baffle plate with four drain openings, there being additionally a spray pipe of perforated type along the apex of an inverted V-shaped baffle above which there is a zig-zag path formed by parallel baffles, the path leading to a gas dome vapor collector, the collector being connected to a vapor compressor form which a discharge extends to the compressed vapor tank and from there through a line to the carburetor or injection system of an internal combustion engine.

3,728,093

PRODUCTION OF SYNTHETIC PIPELINE GAS

William W. Cofield, Houston, Tex., assignor to Transcontinental Gas Pipe Line Corporation, Houston, Tex.

Filed Oct. 14, 1971, Ser. No. 189,144
Claims priority, application Great Britain, Oct. 16, 1970, 49,372/70
Int. Cl. C01b 2/14
U.S. Cl. 48—190 8 Claims



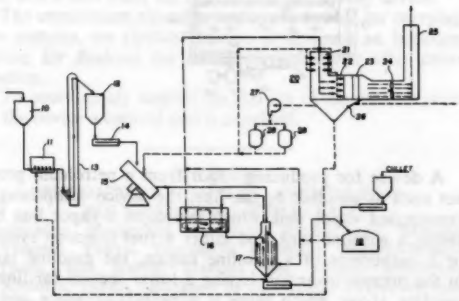
Apparatus for production of synthetic pipeline gas of desired heating value by integrating a system of producing synthetic gas from a carbonaceous material in a gas generator with a system of processing a liquefied natural gas whereby the leaner output from the gas generator is advantageously combined with the richer output from the liquefied natural gas system to provide the desired gas heating value, and the cold temperatures of the liquefied natural gas system is advantageously utilized in the gas generator system.

3,728,094

PROCESS OF MAKING GLASS

George A. Bowman, Pittsburgh, Pa., assignor to Bowman and Associates, Inc.

Filed July 15, 1971, Ser. No. 162,789
Int. Cl. C03b 5/16
U.S. Cl. 65—27 6 Claims



The specification discloses a process for making glass in which, by a combination of integrated steps, waste chemicals in the form of vapor or particulates now lost up the glass furnace stack to atmosphere are recovered and recycled into either agglomerated or unagglomerated glass batch. Also chemicals normally discharged to the sewer in a waste water stream are recovered and recycled into either agglomerated or unagglomerated glass batch. The process also enables recovery and recycling into the glass batch of a substantial percentage of the B.t.u. content of the fuel supplied to melt the glass batch in a standard furnace. The process enables compliance with most regulations regarding air and stream pollution.

3,728,095

CHEMICALLY-STRENGTHENED GLASS-ENCAPSULATED GLASS ARTICLES AND PROCESS THEREFOR

Everett F. Grubb, Friedrich W. Hammer, and Joseph R. Monks, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

No Drawing. Continuation of application Ser. No. 606,550, Jan. 3, 1967. This application Feb. 16, 1971, Ser. No. 115,876
Int. Cl. C03b 29/00; C03c 15/00
U.S. Cl. 65—30 11 Claims

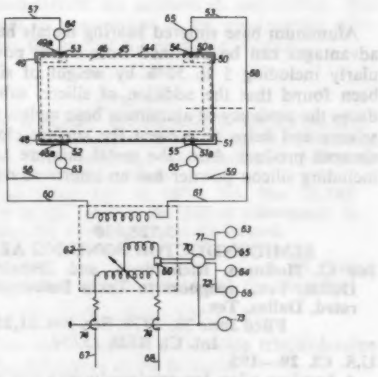
Forming glass articles by encapsulating a main body of a base glass composition with a glass of a different, denser composition during the glass gob-forming stage, forming a glass article from the gob wherein the main body portion is of the base glass and has at least its outer surface covered by the encapsulating glass and heat treating the article to provide an alkali metal ion exchange between abutting glass surfaces so that the surface of the base glass body is under tension and the surface of the encapsulating glass is under compression. The outer surface of the article may subsequently be subjected to an ion-exchange treatment to further increase its compressive stress.

3,728,096

METHOD AND APPARATUS FOR ELECTRICALLY WELDING A DOUBLE WALLED GLAZING UNIT

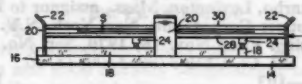
Frederick Harry Hart, Bolton, and William McFegan, St. Helens, England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed Oct. 16, 1970, Ser. No. 81,340
Claims priority, application Great Britain, Oct. 17, 1969, 51,231/69
Int. Cl. C03b 23/20
U.S. Cl. 65—40 11 Claims



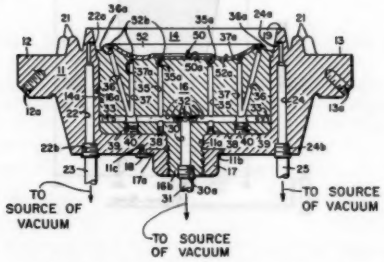
A glass article, e.g. an all-glass multiple glazing unit, is manufactured by uniting at least two glass parts by a continuous weld. The regions of the glass parts to be united are heated to soften the regions and to form the desired weld. This step of heating the region is performed by passing electrical heating currents through said region along two different paths of substantially equal resistance.

3,728,097
COMPRESSION SAGGING OF SHEET GLASS
Lewis L. Bognar, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Apr. 9, 1971, Ser. No. 132,757
Int. Cl. C03b 23/02
U.S. Cl. 65—102 4 Claims



The surface characteristics of as-drawn glass sheet are provided with improved flatness uniformity by positioning such sheet between a pair of precision ground fused silica slabs and subjecting such assembly to controlled radiant heat energy for a predetermined period so as to compressibly sag the sheet between the fused silica slabs and thereby provide improved surface flatness not heretofore obtainable.

3,728,098
MOLD ASSEMBLY
James W. Giffen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 14, 1971, Ser. No. 143,474
Int. Cl. C03b 9/00
U.S. Cl. 65—361 4 Claims

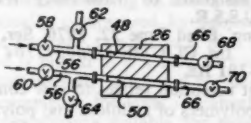


A mold assembly for vacuum forming articles of molten thermoplastic material such as a glass making material. A mold member is separably supported in a cavity of a mold support member with the facing surfaces of the walls of such members in intimate contact with each other. The forming surface of the mold member which is contacted by the thermoplastic material during the forming thereof comprises a foraminous or perforated ceramic coating of a thermal barrier material, the foramina of the coating extending therethrough and connecting said forming surface with vacuum passages extending through the mold member to the exterior thereof for connection with a source of vacuum for the vacuum forming purposes.

3,728,099
METHOD FOR THE TREATMENT OF SEEDS
James William Chiles, Jr., 1710 7th St., Clarksdale, Miss. 39614
No Drawing. Continuation-in-part of application Ser. No. 667,085, Sept. 12, 1967, now Patent No. 3,617,247. This application Mar. 1, 1971, Ser. No. 111,027
The portion of the term of the patent subsequent to Nov. 2, 1988, has been disclaimed
Int. Cl. A01n 21/02
U.S. Cl. 71—77 18 Claims

A method is disclosed for increasing the yield of seedlings emerging from seeds in soil and stimulating the growth of said seedlings by contacting the seeds with a growth-enhancing amount of a compound comprising a carbamylalkenyl phosphorous ester, preferably the dimethyl phosphate of 3-hydroxyl-N-methyl-cis-crotonamide. The growth-enhancing compounds can be applied to the seeds in conjunction with known fungicides, such as, the compound O,O-diethyl-S-2(ethylthio)ethyl phosphorodithioate. The method not only accelerates the growth of the seedlings, but also increases the yield of harvestable crop. The method is particularly suited to the treatment of cottonseeds.

3,728,100
ELECTRIC FURNACE, PARTICULARLY OF THE TYPE USING A DRY CRUCIBLE TO MELT HIGHLY REACTIVE METALS, AND METHOD
Patrick J. Wooding, Moorestown, N.J., assignor to Consarc Corporation, Rancocas, N.J.
Continuation-in-part of application Ser. No. 776,476, Nov. 18, 1968. This application Sept. 3, 1969, Ser. No. 855,001
Int. Cl. C21c 5/52; C22d 7/04; H05b 7/18
U.S. Cl. 75—10 31 Claims



In the preferred embodiment the number of melts per unit time is increased for an electric furnace which uses a crucible to absorb the excess heat load by providing:

(1) Means to rapidly cool the crucible after the power has been removed, or

(2) Small, isolated quantities of water which reduce the explosion hazard.

The cooling means takes the form of passages which extend through the crucible and are connected to a source of water. Water is permitted to enter the passages only after the power has been removed or in small quantities only. When using the dry skull technique, the crucible will have been substantially emptied of molten metal. Means are provided to pass inert gas through the passages to clear residual water.

3,728,101
PROCESS FOR MAKING STAINLESS STEEL
John C. d'Entremont, Middletown, and Charles R. Taylor, Trenton, Ohio, assignors to Armco Steel Corporation, Middletown, Ohio
No Drawing. Filed Nov. 9, 1970, Ser. No. 88,181
Int. Cl. C21c 5/52; C22c 39/14
U.S. Cl. 75—11 9 Claims

An economical process for making a molten ferrous alloy containing from about 5.0 to 30.0% by weight chromium, and up to about 25.0% by weight nickel, which process includes the steps of preparing a charge consisting primarily of the ores of chromium and iron, smelting and reducing said charge by the submerged-arc process in a first vessel to yield a high carbon, high silicon molten alloy, transferring said alloy to a second vessel, directing gaseous oxygen thereagainst to reduce the carbon and silicon, and thereafter introducing a mixture of gaseous oxygen and an inert gas into said molten alloy below the surface thereof to complete the refining and to minimize the loss of chromium.

3,728,102

ANTI-PIPING COMPOSITION FOR THE PRODUCTION OF METAL INGOTS AND CASTINGS

William T. Buckingham, Cleveland, Ohio, assignor to Foseco International Limited, Nechells, Birmingham, England

No Drawing. Continuation of abandoned application Ser. No. 783,703, Dec. 13, 1968. This application Mar. 1, 1971, Ser. No. 119,943

Claims priority, application Great Britain, Dec. 13, 1967, 56,704/67

Int. Cl. C22b *9/08, 9/10*

U.S. Cl. 75—94 8 Claims

Anti-piping compositions comprising aluminium and oxidising agent are improved by the addition of a flame generating material such as paper pulp, sawdust, wood flour or cob flour.

3,728,103

METHOD OF REMOVING METAL VALUES FROM SOLUTION

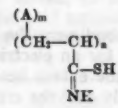
Marina Osipovna Lishevskaya and Alexandr Davidovich Virnik, Moscow, Genrikh Aramaisovich Gabrielian, Mytischi, Moskovkaya Oblast, Zakhar Alexandrovich Rogovin, Moscow, and Vladimir Fedorovich Borbat, Alexandr Mikhailovich Orlov, Mirriam Borisovna Ferberg, and Nina Ivanovna Markelova, Norilsk, U.S.S.R., assignors to Moskovsky textilny Institut, Moscow, U.S.S.R.

No Drawing. Filed June 22, 1970, Ser. No. 48,518

Int. Cl. C22b *43/00, 11/04*

U.S. Cl. 75—101 BE 11 Claims

The present invention relates to new compounds which are grafft copolymers of cellulose and polyacrylthioamide and graft copolymers of synthetic polymers and polyacrylthioamide with the general formula



wherein

A is cellulose or a synthetic polymer,

m is the degree of polymerization of cellulose and the degree of polymerization of such synthetic polymer ranging from 150 to 2,000,

n is the degree of polymerization of polyacrylthioamide ranging from 400 to 4,000, as well as to a method of producing said new compounds and to application thereof.

The method of producing said compounds resides in treating graft copolymers of cellulose and polyacrylonitrile, or graft copolymers of synthetic polymers and polyacrylonitrile, with hydrogen sulphide or with salts of hydrosulphuric acid in an aqueous or an organic medium at a temperature of 60–100° C. and subsequently isolating the target product.

The herein-proposed compounds can find application as electron-exchange complex-forming materials in chemical industry, metallurgy, and in other industries.

3,728,104

COBALT RECOVERY

Thomas Hunter Coffield, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Filed Apr. 29, 1971, Ser. No. 138,757

Int. Cl. C22b *3/00*

U.S. Cl. 75—101 BE 18 Claims

A process for recovery of cobalt from a hydrometallurgical reaction mixture prepared in a process for winning cobalt and/or nickel by contacting the reaction mixture containing cobalt tetracarbonyl anion with a strong acid and decomposing the cobalt carbonyl hydride formed to cobalt carbonyl, separating the cobalt carbonyl from the acidified reaction mixture and thermally decomposing the cobalt carbonyl to metallic cobalt and recovering the metallic cobalt.

3,728,105

EXTRACTION OF METAL VALUES FROM MANGANESE DEEP SEA NODULES

Roald R. Skarbo, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,131

Int. Cl. C22b *3/00, 5/00, 15/10*

U.S. Cl. 75—103 11 Claims

Copper, nickel, cobalt and molybdenum may be leached from deep sea manganese nodules using an aqueous ammoniacal ammonium solution at elevated temperatures and pressures.

3,728,106

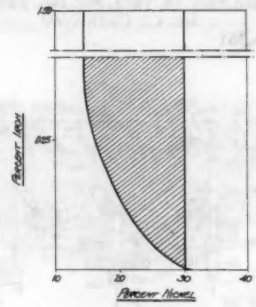
WROUGHT COPPER-NICKEL ALLOY

Frank A. Badia, Ringwood, N.J., David B. Anderson, Wilmington, N.C., and Gary N. Kirby, Ann Arbor, Mich., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 13, 1969, Ser. No. 876,541

Int. Cl. C22c *9/06*

U.S. Cl. 75—159 7 Claims



Wrought copper-nickel alloys containing special amounts of chromium exhibit improved resistance to the impingement erosion effects of high velocity seawater. Small amount of iron also improve "parting" corrosion characteristics of alloys of lower nickel content.

3,728,107

ADDITIVES FOR PRODUCTION OF CAST IRONS

Domingos Loricchio, Sao Paulo, Brazil, assignor to The Carborundum Company, Niagara Falls, N.Y.

No Drawing. Original application Feb. 16, 1971, Ser. No. 115,694, now Patent No. 3,682,625, dated Aug. 8, 1972. Divided and this application Jan. 3, 1972, Ser. No. 214,961

Int. Cl. C22c *37/02, 37/04*

U.S. Cl. 75—130 R 2 Claims

The addition of silicon carbide pelleted with chromite to molten iron has been found to homogenize the microstructure to control the hardness. An addition in the range of 0.10 to 1.0% silicon carbide pelleted with chromite increases the hardness of a casting. Catalytically activated silicon carbide in the range of from 0.1 to 1.5% by weight has also been found to reduce the hardness of an iron alloy. The additions are preferably made in the molten stage immediately subsequent to the exit from the furnace or cupola when casting the metal in the pan or forecrucible.

3,728,108
PROCESS FOR THE PRODUCTION OF REINFORCED COMPOSITE ALLOYS

Raymond Sifferlen, Saint-Ismier, Claude Guichard, Fontaines, and Jean-Claude Soret, Saint-Egreve, France, assignors to Societe Industrielle de Combustible Nucleaire, Annecy, France

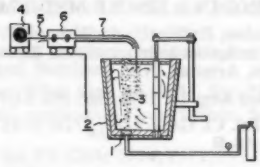
Filed Mar. 31, 1970, Ser. No. 24,252
Claims priority, application France, Mar. 31, 1969, 6909746
Int. Cl. C22c *1/00*
U.S. Cl. 75—135 8 Claims

Reinforced composite alloys having improved characteristics and good ductility comprising a base metal or a metal alloy in which filaments or particles which are insoluble in the base metal, both in the solid state and the liquid state, and further characterized in that the particles or filaments are dispersed in a homogeneous manner in the base metal and perfectly bonded to the base metal are disclosed. A process and an apparatus for the preparation of the reinforced composite alloys are disclosed also.

3,728,109
MANUFACTURING METHOD OF FREE-CUTTING LEAD STEEL

Masuta Okubo and Takaho Kawawa, Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kawasaki-shi, Japan

Filed Sept. 29, 1970, Ser. No. 76,428
Claims priority, application Japan, Oct. 4, 1969, 44/79,062
Int. Cl. C21c *7/00*; C22c *39/54*
U.S. Cl. 75—51 6 Claims



This invention relates to a method of producing free-cutting lead steel comprising pouring the molten steel into a ladle, stirring the steel by passing thereinto a gaseous material which does not harmfully affected the quality of the steel, and feeding a wire rod of lead or a lead alloy into the molten steel at an adding velocity of 1 to 20 metres per second, said wire rod having a diameter of 5–20 mm.

3,728,110
PROCESS FOR FORMING A SINTERED BRIQUETTE

Erhard Klar, Pikesville, and Algirdas E. Petrosh, Baltimore, Md., and Arthur B. Michael, Milwaukee, Wis., assignors to SCM Corporation, Cleveland, Ohio

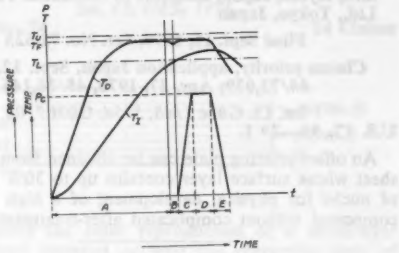
No Drawing. Filed Dec. 10, 1968, Ser. No. 782,774
Int. Cl. B22f *1/00*
U.S. Cl. 75—211 8 Claims

Compactable, particulate compositions for compaction molding into briquettes comprising finely divided solids, containing normally liquid phase lubricant in excess of that which can be sorbed readily on said finely divided solids in admixture with a sorptive agent more highly sorptive of the lubricant than are the compactable finely divided solids. The sorptive agent sequesters unbound lubricant and improves the handling properties of the compactable powder composition.

3,728,111
METHOD OF MANUFACTURING BILLETS FROM POWDER

Ingemar Stromblad, Vasteras, and Sven-Erik Isaksson, Robertsfors, Sweden, assignors to Allmanna Svenska Electriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 21, 1971, Ser. No. 182,451
Int. Cl. B22f *1/00*
U.S. Cl. 75—214 13 Claims



For manufacturing billets out of powder for further machining by rolling, forging or machining, powder is poured into a container having an evacuating opening and is then isostatically compressed by subjecting the container with the enclosed powder to a high extreme pressure. The billet is placed in a heated furnace and heated while it is simultaneously evacuated for degassing. After evacuation is completed, the billet is preheated in another furnace to a temperature suitable for pressure sintering and then in another furnace is subjected simultaneously to high heat and high pressure.

3,728,112
ELECTROPHOTOGRAPHIC MULTICOLOR COPY PROCESS EMPLOYING SOLUBILIZABLE DYES

Leo N. Chapin, Des Plaines, and Robert Freed, Lincolnwood, Ill., assignors to A. B. Dick Company, Niles, Ill.

Filed Dec. 1, 1970, Ser. No. 94,125
Int. Cl. G03g *9/02, 13/08, 13/14*
U.S. Cl. 96—1.2 21 Claims

This invention is addressed to an electrophotographic copy process for the production of true color copies in which at least two receptor sheets, each of which is provided with a binder, a photoconductor, a sensitizing component which sensitizes the photoconductor to at least a portion of the spectrum of visible light and a dispersed dye of a different color on each receptor, are separately given an electrostatic charge and exposed to an original such as a multi-color original, and the exposed receptor sheets are thereafter developed with a developer composition containing a toner in the form of a material which, in response to activation, serves as a solvent for the dispersed dye to effect transfer of the dye color from the underlying portions of each coating to a copy sheet pressed into surface contact with each receptor.

3,728,113
SELECTIVE TRANSFER SYSTEM AND COMPOUNDS FOR EMPLOYMENT THEREIN

Richard W. Becker, John A. Ford, Jr., Donald L. Fields, and Delbert D. Reynolds, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 6, 1971, Ser. No. 160,070
Int. Cl. G03c *1/40, 5/54, 7/00*
U.S. Cl. 96—3 22 Claims

A photographic element is provided in which a cleavable compound is employed to effect the imagewise elimination of a selected chemical moiety, such as a dye, a silver halide solvent, an antifoggant, a fixing agent, a toner, a hardener, a silver complexing agent, a fogging agent, a coupler, a sensitizer, a desensitizer, a developer,

an oxidizing agent, etc. Color diffusion transfer processes and film units employing such cleavable compounds are also described.

3,728,114

DIRECT POSITIVE SHEET AND AN OFFSET PRINTING PLATE PRODUCED THEREFROM

Kiyoshi Futaki, Shigeyoshi Suzuki, and Yoshitake Yoshihiro, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sept. 11, 1970, Ser. No. 71,623

Claims priority, application Japan, Sept. 12, 1969, 44/72,039; Apr. 27, 1970, 45/36,146

Int. Cl. G03c *1/48, 5/54;* G03f *7/02*

U.S. Cl. 96—29 L **7 Claims**

An offset printing plate can be obtained from a positive sheet whose surface layer contains up to 30% by weight of nuclei for physical development of a high molecular compound without complicated after-treatment.

3,728,115

PHOTOGRAPHIC DRY COPYING MATERIAL

Albert Lucien Poot, Kontich, and Jan Frans van Besauw, Brasschaat, Belgium, and Anita von König, Leverkusen, and Helmut Kampfer, Cologne, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 13, 1971, Ser. No. 143,226

Claims priority, application Germany, May 14, 1970, P 20 23 629.7

Int. Cl. G03c *1/40, 1/76, 3/26*

U.S. Cl. 96—29 D **20 Claims**

Photographic copies are produced by image-wise exposing a light-sensitive layer which contains a light-sensitive photo-oxidizing compound and an image-producing pyrazolin-5-one capable of being transferred to an image-receiving layer, the image-producing compound in the exposed areas being converted into a non-transferable compound by reaction with the light-sensitive compound, bringing the exposed layer into contact with an image-receiving layer which contains compounds which react with the image-producing compound to form colored compounds and heating of the layers while in contact with each other to a temperature of between 80 and 200° C. at which the image-producing compound is transferred from the unexposed areas of the light-sensitive layer to the image-receiving layer.

3,728,116

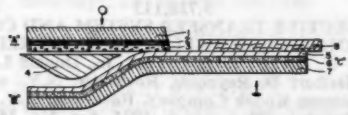
INSTANT ACCESS ONE-LAYER COLOR PHOTOGRAPHY

Burton Harvey Waxman; Robert Thomas Shannahan, both of Endicott, and Felix Viro, Appalachin, all of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed June 15, 1971, Ser. No. 153,186

Int. Cl. G03c *1/40, 5/54, 7/08*

U.S. Cl. 96—29 D **11 Claims**



An improved instant access diffusion transfer process for photographic materials in which multicolor dye images are produced in a transfer sheet by exposing a panchromatically sensitized silver halide emulsion through a single multicolor screening layer and subsequently developing the emulsion at a high pH and transferring it to an unsensitized receiving sheet.

3,728,117

OPTICAL DIFFRACTION GRID

Johannes Heidenhain, Egerer, near Chieming, Horst Burkhardt, Stein an der Traun, and Heinz Kraus, Traunreut, Germany, assignors to Fa. Dr. Johannes Heidenhain, Traunreut, and Gunter Schmahl and Dietbert Rudolph, Gottingen-Greismar, Germany

Filed Dec. 18, 1968, Ser. No. 784,686

Claims priority, application Germany, Jan. 20, 1968, P 16 22 834.5

Int. Cl. G02b *5/18;* G03c *11/00*

U.S. Cl. 96—36 **5 Claims**

A method of producing optical diffraction grids having a predetermined asymmetric groove profile which comprises the steps of exposing a light sensitive layer to at least one system of fringes of light and positioning the light sensitive layer relative to the fringe system in such a manner that the locally resulting exposure is an asymmetric function with respect to a normal to the surface of the light sensitive layer, and subsequently developing the light sensitive layer.

3,728,118

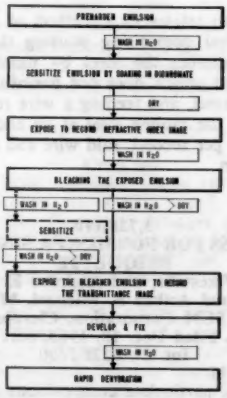
PROCESS FOR PRODUCING MULTIPLE RECORDING IN A SINGLE MEDIUM

Gary L. Fillmore, Endicott, and Richard F. Tynan, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,473

Int. Cl. G03c *5/22, 5/26, 5/38*

U.S. Cl. 96—48 R **6 Claims**



The invention describes a method for individually recording a transmittance image and a refractive index image in a single photographic emulsion.

The invention relates to a method for recording different images in a single photographic emulsion, the latter

when processed in accordance with the invention providing, among other things, a unique type of complex-valued spatial filter.

3,728,119

PRODUCTION OF POSITIVE COPPER IMAGES UTILIZING PHOTOSENSITIVE LEAD COMPOUNDS

Johan Eugeen Vanhalst, Wilrijk, Walter August Van den Heuvel, Berchem, and Eric Maria Brinckman, Mortsel, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

No Drawing. Filed Feb. 16, 1971, Ser. No. 115,808

Claims priority, application Great Britain, Feb. 17, 1970, 7,584/70

Int. Cl. G03c 5/24

U.S. Cl. 96—48 R 7 Claims

An image reproduction system is provided using a photosensitive recording material containing a photosensitive lead compound capable of separating metallic lead on exposure to activating electromagnetic radiation. The lead compound stands in working contact with a reducing agent capable to promote the formation of metallic lead in the exposed portions. In a first step a print-out lead image is formed. In a second step the print-out lead image is removed and simultaneously a positive copper metal image is formed by a treatment with an aqueous copper (II) solution. As photosensitive lead compounds yellow lead(II) oxide and lead(II) iodide are preferred. The formation of metallic lead is promoted by ascorbic acid and the formation of metallic copper by sodium dithionite.

3,728,120

FORMATION OF RELIEF IMAGES

Edwin Hendrik Hazenbosch, Mechelen, and Albert Lucien Poot, Kantich, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

No Drawing. Filed Sept. 17, 1971, Ser. No. 181,635

Claims priority, application Great Britain, Sept. 18, 1970, 44,668/70

Int. Cl. G03c 5/24, 1/72, 7/16

U.S. Cl. 96—48 R 20 Claims

A colloid pattern is formed by a process containing the steps of:

(1) information-wise exposing a hydrophilic colloid layer containing a mixture of:
  (a) a photosensitive organic polyhalogen compound, which is capable of forming by exposure to activating electromagnetic radiation (a) halogen-containing free radical(s),
  (b) an amino compound with aromatic character, and
  (c) a hydrophilic colloid that is capable of undergoing a hardening or decrease of water-solubility by a treatment with an aldehyde hardening agent suited for the hardening of protein colloids,
(2) treating the information-wise exposed colloid layer with said aldehyde hardening agent effecting a selection hardening in the unexposed portions of the recording layer, and
(3) removing the exposed portions of the colloid layer by means of a wash-off treatment leaving a relief pattern corresponding with the non-exposed portions of the colloid layer.

The hydrophilic colloid layer contains preferably gelatin as hydrophilic colloid, carbon tetrabromide as photosensitive organic polyhalogen compound, diphenylamine or N,N'-diphenyl-N,N'-diethylenediamine as aromatic amine and a colored pigment for obtaining by said process a colored colloid pattern.

3,728,121

MULTILAYER COLOR PHOTOGRAPHIC MATERIAL

Hugo K. Zorn, Munich-Lochhausen, and Fritz Muller and Helmut W. Broll, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 19, 1970, Ser. No. 65,194

Claims priority, application Germany, Aug. 19, 1969, P 19 42 079.2

Int. Cl. G03c 1/76

U.S. Cl. 96—74 14 Claims

To improve the color reproduction of a multi-layer color reversal material, at least one correcting layer of a fine-grained silver halide emulsion having a grain diameter below 1μ is incorporated in the material. It may be disposed over the uppermost, under the lowermost or between the active emulsion layers. The correcting layer may be spectrally sensitized or unsensitized, may be ripened with gold and may include a single halide or a mixture of several.

3,728,122

ONE-COMPONENT DIAZOTYPE LIGHT-SENSITIVE MATERIAL

Shigeaki Yoshida, Yokohama, Shuhei Shiraishi, Fujisawa, and Fumio Yuki, Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,932

Claims priority, application Japan, Dec. 17, 1969, 44/100,878

Int. Cl. G03c 1/60

U.S. Cl. 96—75 5 Claims

One-component diazotype light-sensitive material containing a condensation product made from naphthalenesulfonate or alkylnaphthalenesulfonate and formaldehyde as a stabilizer in a precoat layer on a supporting sheet, said material having good stability.

3,728,123

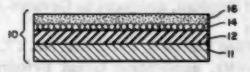
PLATE FOR DRY PLANOGRAPHY

Harry Frank Gipe, Baltimore, Md., assignor to Scott Paper Company, Philadelphia, Pa.

Original application Nov. 14, 1969, Ser. No. 876,688, now Patent No. 3,632,375, dated Jan. 4, 1972. Divided and this application May 20, 1971, Ser. No. 145,224

Int. Cl. G03c 1/52, 1/64, 1/66

U.S. Cl. 96—75 3 Claims



A negative acting presensitized plate for use in dry planography, said plate comprised of a flexible substrate having coated thereon a layer of silicone rubber which when cured will not accept printing ink, a layer of polymeric anchoring material overlying and adhered to the silicone rubber layer and a layer of photoresponsive image forming material coated over said anchoring material with the anchoring material serving to bond the photoresponsive image forming material to the silicone layer.

3,728,124

COLORATION OF POLYESTER FILM MATERIALS

James Lyon Whyte, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Dec. 2, 1970, Ser. No. 94,564
Claims priority, application Great Britain, Dec. 5, 1969, 59,512/69
Int. Cl. G03c 1/84
U.S. Cl. 96—84 R 10 Claims

Grey dyed polyester photographic film support dyed with at least two dye components selected from 6-para-toluidino-3-methyl 1'9' anthrapiridone, indanthrone, tetrachloro phthalo perinone and 1,4-bis(4-n-butyl-anilino)-5,8-dihydroxy anthraquinone.

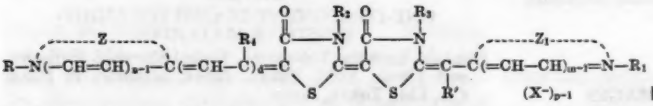
3,728,125

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL SUITABLE FOR SILVER-DYE BLEACHING METHOD

Keisuke Shiba, Masanao Hinata, Makoto Yoshida, Shinichi Imai, Akira Sato, and Shigeru Watanabe, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Aug. 20, 1970, Ser. No. 65,714
Claims priority, application Japan, Aug. 20, 1969, 44/65,827
Int. Cl. G03c 1/10
U.S. Cl. 96—99 14 Claims

A light-sensitive silver halide emulsion containing a dye capable of being bleached in the silver dye bleaching process and at least one sensitizing dye having the general Formula I



[I]

wherein R, R_1, R_2 and R_3 each is selected from the group consisting of an alkyl, a substituted alkyl, an allyl, an aralkyl, a substituted aralkyl and an aryl group; wherein R' is selected from the group consisting of a hydrogen atom, an alkyl group, a substituted alkyl group, and an aliphatic chain to be combined with the N of the heterocyclic ring containing Z_1; wherein R_4 is selected from the group consisting of a hydrogen atom, an alkyl and an aryl group; wherein *m*, *n*, and *p* are 1 or 2, and *d* represents 0, 1 or 2; wherein X represents an anion, wherein an intramolecular salt is formed when $p=1$; and wherein Z and Z_1 each is the non-metallic atomic group necessary to complete a 5- or 6-membered heterocyclic ring, is disclosed. The emulsion can be super-sensitized by the addition of a supersensitizing dye to the emulsion.

3,728,126

SILVER HALIDE EMULSION CONTAINING AN ORGANIC SELENIUM COMPOUND ANTIFOGGING AGENT

Robert Joseph Pollet, Vremde, and Jozef Frans Willems, Wilrijk, both of Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed March 6, 1970, Ser. No. 17,304
Claims priority, application Great Britain, July 3, 1969, 12,234/69
Int. Cl. G03c 1/34
U.S. Cl. 96—109 10 Claims

Light-sensitive materials comprising a silver halide emulsion layer and a compound having the formula:

$$R_1—Q—Se—R_2$$

wherein:

Q stands for selenium or sulphur, and

each of R_1 and R_2 (the same or different) stands for an alkyl group, an aralkyl group or an aryl group.

The compound of the general formula inhibits fogging and/or bronzing and/or stabilizes the emulsion.

3,728,127

SODIUM CASEINATE-CONTAINING PRODUCT AND METHOD FOR MANUFACTURING

Gaylord M. Palmer, Castro Valley, Calif., assignor to Foremost-McKesson, Inc., San Francisco, Calif.

Filed Aug. 18, 1970, Ser. No. 64,726
Int. Cl. A23j 1/20, 1/22, 3/02
U.S. Cl. 99—20 19 Claims

A dry instantized sodium caseinate powder with essentially all of the particles containing a coating of water-soluble saccharide (e.g., corn syrup solids) in which a surfactant (e.g., lecithin) is dispersed. A process of forming this product includes the step of dry blending spray-dried sodium caseinate powder and fine saccharide powder, moistening the blend by subjecting thesame to a moist atmosphere containing finely divided surfactant to form moist aggregates and drying the aggregates. The moist atmosphere may be an atomized aqueous dispersion formed by mixing lecithin, water, and steam.

3,728,128

PREPARATION OF A BLAND WHEY PRODUCT

Anthony J. Luksas, Chicago, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 737,803, June 18, 1968. This application Oct. 5, 1970, Ser. No. 78,306
Int. Cl. A23c 21/00
U.S. Cl. 99—57 8 Claims

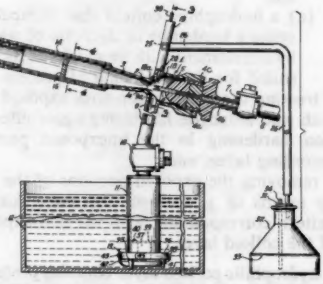
The objectionable odors and tastes of whey are removed therefrom and a bland whey product is produced by growing yeasts in a fluid whey system containing at least 10 p.p.m. of dissolved oxygen to substantially prevent fermentation and provide assimilation.

3,728,129

METHOD FOR PREPARING AND DISPENSING AERATED DRINKS

Ralph G. Sargeant, 408 W. Windsor St., Lakeland, Fla. 33803

Continuation-in-part of application Ser. No. 76,040, Sept. 28, 1970, which is a continuation-in-part of abandoned application Ser. No. 856,064, Sept. 8, 1969. This application Mar. 29, 1971, Ser. No. 128,711
Int. Cl. A23l 1/00
U.S. Cl. 99—78 10 Claims



Method of preparing drinks, such as orange juice, by combining a diluting liquid with a liquid beverage concentrate. A high velocity stream of one of the liquids is di-

rected through the restricted throat of a Venturi located in a flow confining zone causing the other liquid ingredient to be drawn into this zone. This preliminary mixture is then forcibly impinged on a baffle surface in a final mixing zone. Air, preferably with a volatile flavor and/or aroma additive entrained therein, is introduced either into the flow confining zone where it becomes part of the preliminary mixture or into the final mixing zone upstream of the baffle.

3,728,130

PASTA CONTAINING ETHOXYLATED MONOGLYCERIDES

Richard R. Egan, Worthington, Ohio, and Ira A. MacDonald, Prior Lake, Minn., assignors to Ashland Oil, Inc., Columbus, Ohio

No Drawing. Filed Feb. 19, 1971, Ser. No. 117,054
Int. Cl. A23l *1/16*
U.S. Cl. 99—85 **9 Claims**

Pasta is prepared by forming and drying a pasta dough comprising flour, liquid and ethoxylated monoglycerides. The ethoxylated monoglycerides tend to improve the machinability of the dough and decrease the stickiness of the pasta during drying and the resulting pasta is firmer after cooking than pastas not containing ethoxylated monoglycerides.

3,728,131

TREATMENT OF BANANAS WITH CALCIUM HYDRATED LIME AND PRODUCT THEREOF

Ariens Damwyk, 37 Melendy Ave., East Watertown, Mass. 02172

Filed July 27, 1970, Ser. No. 58,304
Int. Cl. A23l *1/00*
U.S. Cl. 99—103 **12 Claims**

The invention relates to an edible dried banana product produced from peeled ripe bananas which are sliced and dipped in an aqueous solution of high calcium hydrated lime and thereafter dried at a temperature of about 80° to 150° F. for a period of up to about 160 hours, preferably with air circulation.

3,728,132

PROCESS FOR THE PRODUCTION OF FOODS AND DRINKS

Naoto Tsuyama, Mamoru Hirao, Masashi Kurimoto, Kaname Sugimoto, and Masakaza Mitsuhashi, Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

No Drawing. Filed Nov. 17, 1970, Ser. No. 90,418
Claims priority, application Japan, Nov. 17, 1969, 44/91,980; Jan. 14, 1970, 45/3,977; Mar. 28, 1970, 45/26,270
Int. Cl. A23l *1/26*
U.S. Cl. 99—141 R **12 Claims**

The present invention relates to a process for the production of various foods and drinks utilizing previously unknown sweeteners, comprising the addition of sucrose or sugars containing fructose to starch hydrolyzate, subjecting the mixture to actions of *Bacillus macerans* amylase, bacterial sacchalogenic-α-amylase (B.S.A.), fungal α - amylases, or pancreas amylase, producing oligosaccharide syrups containing transferred fructose and then utilizing the syrups as a material for the production of the said foods and drinks.

3,728,133

FOAMED MAYONNAISE COMPOSITION

Max E. Norris, Parma, Ohio, assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Aug. 11, 1971, Ser. No. 171,009
Int. Cl. A23l *1/24*
U.S. Cl. 99—144 **16 Claims**

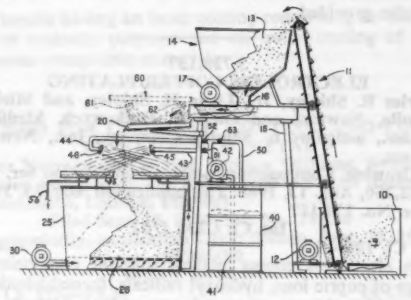
A mayonnaise composition having a specific gravity of from 0.35–0.7 gm./cm.^{3} comprising water, vinegar, egg yolk, spices, and an emulsifier comprising in combination a hydroxy acid ester of a glyceride and a monoglyceride is set forth.

3,728,134

METHOD FOR REDUCING BACTERIA LEVEL OF DEHYDRATED ONION PRODUCTS WITH H_2O_2

Jerry Gilmore and John A. Scarlett, Modesto, Calif., assignors to Rogers Brothers Company, Livingston, Calif.

Filed Dec. 17, 1970, Ser. No. 99,005
Int. Cl. A23b *7/10, 7/02*
U.S. Cl. 99—156 **6 Claims**



Dehydrated onion aspirations and screenings of high bacteria count are sprayed with an aqueous hydrogen peroxide solution of low concentration. On being dried in a heated air stream, onion pieces are obtained which may be ground into a dehydrated powder either alone or in a blend with other onion pieces. The treatment with peroxide has the effect of greatly reducing the total bacteria count of the resulting powder, while minimizing or eliminating bleaching and loss of color and flavor.

3,728,135

WITHDRAWN

3,728,136

PROCESS AND APPARATUS FOR SHAPING FROZEN FLESH

Ian H. Langlands, Halifax, Nova Scotia, Canada, assignor to National Sea Products Limited, Halifax, Nova Scotia, Canada

Filed Feb. 19, 1970, Ser. No. 12,567
Claims priority, application Canada, Oct. 30, 1969, 66,256/69
Int. Cl. A23b *1/00*
U.S. Cl. 99—194 **17 Claims**

A method and apparatus for forming a pre-shaped food product, particularly fish, and the pre-shaped food product produced thereby are described. The method includes the step of forming individual portions of the flesh, each being of predetermined size and being at least in a partially frozen condition, into a predetermined shape by forcing the flesh portions individually into a forming die cavity adapted to impart the predetermined shape to each portion. The volume of each portion prior to the forming step equals the volume of each corresponding formed food portion. The frozen pre-shaped edible flesh food product has a smoothly contoured marginal outline in plan view, with the flesh adjacent the marginal edge being in a deformed condition relative to the flesh in the central region of the product. The apparatus includes a forming station having a forming die all arranged to engage and form portions of flesh fed thereto. A device for feeding individual portions of the flesh to the forming station is provided as well as mechanism for effecting actuation of the feeding device and the forming die in timed relation to

one another to effect forming of the flesh portions. The forming station includes a fixed platen with the feeding device being arranged to feed each flesh portion to a position intermediate the forming die and the platen when the die is in a retracted position. When the forming die is advanced the flesh portions are engaged in pressurized relation between the die and the platen. The feeding device includes an endless conveyor belt defining a path of travel which extends over the fixed platen and the conveyor belt is driven in step-by-step fashion to bring successive flesh portions intermediate the forming die and the fixed platen to permit them to be formed in sequential fashion. Ejecting means associated with the die for positively ejecting the formed flesh therefrom when the die is retracted are also provided.

3,728,137

ELECTROLESS COPPER PLATING

Charles R. Shipley, Jr., Lucia H. Shipley, and Michael Gulla, Newton, and Oleh B. Dutkewych, Medfield, Mass., assignors to Shipley Company, Inc., Newton, Mass.

No Drawing. Continuation-in-part of application Ser. No. 752,250, Aug. 13, 1968. This application Aug. 23, 1971, Ser. No. 174,157

Int. Cl. C23c *3/02*

U.S. Cl. 106—1 **7 Claims**

An electroless copper plating solution comprising a source of cupric ions, hydroxyl radicals, formaldehyde or a formaldehyde precursor such as paraformaldehyde and a complexing agent for copper; said solution characterized by the addition of a formaldehyde addition agent. The formaldehyde addition agent provides for the slow release of formaldehyde into solution and contributes to improved tensile properties of a copper deposit.

3,728,138

FLAME-RETARDANT AND INTUMESCENT COMPOSITIONS

Erich Kuehn, Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Original application May 3, 1968, Ser. No. 726,538, now Patent No. 3,639,535, dated Feb. 1, 1972. Divided and this application Jan. 5, 1971, Ser. No. 104,149

Int. Cl. C09d *5/18*

U.S. Cl. 106—15 FP **10 Claims**

Novel adjuvants and combinations thereof are provided which have the properties of importing flame-retardancy and intumescence to polymeric materials. The new adjuvants comprise halogenated and phosphorus-containing adjuvants of diallyl chlorendate and mineral acid salts of phenylbiguanidine derivatives. The latter may be advantageously combined with a wide variety of phosphorus-containing compounds, including especially, novel diallyl chlorendate derivatives to provide intumescent films and coatings.

3,728,139

DURABLE BOROSILICATE OPAL GLASSES

Gerald B. Carrier and James E. Flannery, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,834

Int. Cl. C03c *3/08, 3/22, 3/30*

U.S. Cl. 106—54 **3 Claims**

The present invention relates to borosilicate opal glasses containing a discontinuous opal phase which exhibit improved chemical durability as well as low thermal expansivity. These glasses preferably consist essentially, in weight percent on the oxide basis as calculated from the batch, of 72–76% SiO_2, 9–14% B_2O_3, 1–6% of alkali metal oxides, 3–9% of bivalent metal oxides, 0.5–2.0% TiO_2, 0–0.5% ZrO_2, 0–1.5% Al_2O_3, and 1–2% of oxides selected from the group consisting of MoO_3, WO_3, and As_2O_3.

3,728,140

PROCESSES FOR THE PRODUCTION OF AMYLOSE FILM

Mikihiko Yoshida, Okayama, Japan, assignor to Hayashibara Company, Okayama, Japan

No Drawing. Filed Jan. 26, 1971, Ser. No. 109,940

Claims priority, application Japan, Jan. 26, 1970, 45/7,163

Int. Cl. C08b *25/02*

U.S. Cl. 106—210 **8 Claims**

Processes for the economical production of starch film with high transparency, comprising hydrolysis of various starches utilizing alpha-1,6-glucosidase, blending the hydrolyzate with amylomaize starch in which amylose is the main constituent or to commercially available amylose, the hydrolyzate being an amylose of which short chain amylose is its main constituent, and forming films with the mixture.

3,728,141

ALKALINE-CURING CORRUGATING ADHESIVE

Dilip K. Ray-Chaudhuri, 484 Rolling Hills Road, Somerville, N.J. 08876; Jules E. Schoenberg, 2079 Lyde Place, Scotch Plains, N.J. 07076; and Keith E. Sickafoose, R.D. 1, Box 568, Princeton, N.J. 08540

No Drawing. Continuation-in-part of abandoned application Ser. No. 105,607, Jan. 11, 1971. This application July 12, 1972, Ser. No. 271,319

Int. Cl. C08b *25/02*

U.S. Cl. 106—213 **16 Claims**

Starch-based alkaline curing corrugating adhesives containing a novel crosslinking additive for use in the manufacturing of corrugated paperboard are described: said adhesives are characterized by their excellent stability with respect to viscosity, prolonged pot life, and their ability to form water-resistant bonds.

3,728,142

READILY DISPERSIBLE INORGANIC PIGMENTS

Hans Rudolph, Krefeld-Bockum, Gerhard Trenczek, Krefeld-Uerdingen, and August Böckmann, Klaus Prater, and Walter Gutsche, Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,124

Claims priority, application Germany, Jan. 14, 1970, P 20 01 381.4

Int. Cl. C09c *1/36*

U.S. Cl. 106—300 **7 Claims**

An inorganic pigment such as titanium dioxide is rendered readily dispersible by providing it with a coating of an alkyd resin including radicals of a polycarboxylic acid and at least about 25% by weight of the radicals of fatty acids containing more than 6 carbon atoms, and further including radicals of polyols containing at least 3 hydroxyl groups, the ratio of oxygen atoms to carbon atoms in the polyol molecule not exceeding 0.7:1.

3,728,143

PIGMENT DISPERSION

Edward T. Pollard, Vermilion, Ohio, assignor to Plastic Molders Supply Co., Inc., Fanwood, N.J.

No Drawing. Filed Mar. 31, 1971, Ser. No. 129,968

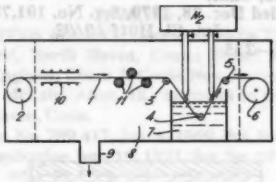
Int. Cl. C09c *3/00*

U.S. Cl. 106—308 N **20 Claims**

Fatty acid amide coated pigments are obtained and used to formulate with uncolored thermoplastic materials. The colors of the pigments are fully developed and extremely high pigment loadings are obtained. The coated pigments are formed by admixing the pigment with melted fatty acid amide; solidifying the material by cooling it; grinding the material; and separating out the fines. The coated pigment particles are compounded with thermoplastic materials by low shear means, such as, injection molding. An improved form of the coated pigments can be obtained by admixing the melted fatty acid amide, and the pigment; extruding the admixture to form a creamy mass; solidify-

ing and forming the creamy mass by passing it through cold and forming rollers; grinding the resultant wafer-like material; and separating out the fines.

3,728,144
METHOD FOR COATING METAL SUBSTRATES WITH MOLTEN METAL
Lionel Van Poucke, Kortrijk, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium
Filed Apr. 16, 1971, Ser. No. 134,738
Claims priority, application Netherlands, Apr. 24, 1970, 7006051
Int. Cl. C23c *1/00*
U.S. Cl. 117—51 7 Claims



A method and apparatus for continuous coating of a metal substrate with a molten metal in which a metal substrate is successively annealed at an elevated temperature in a heating zone, cooled in a cooling zone and coated with a molten metal in an immersion zone, wherein the heating zone, the cooling zone and the immersion zone are maintained under a vacuum.

3,728,145
METHOD FOR TREATING A TRANSPARENT TUBE FOR USE IN AN OPTICAL ANALYZING APPARATUS
Vilhelm Einar Stellan Hjerten, Uppsala, Sweden, assignor to Incentive Research & Development AB, Stockholm, Sweden
Continuation-in-part of abandoned application Ser. No. 721,481, Apr. 15, 1968. This application Apr. 15, 1971, Ser. No. 134,152
Claims priority, application Sweden, Apr. 20, 1967, 5,527/67
Int. Cl. C03c *17/32, 19/00*
U.S. Cl. 117—54 26 Claims

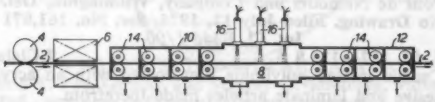
A method for treating transparent tubes to eliminate the electroendosmotic effect comprising coating of the inner wall of the tube with a neutral hydrophilic substance, e.g. methyl cellulose, which eliminates electroendosmosis by increasing the viscosity or the resistance to flow adjacent to the tube wall for a liquid in the tube. Also the optical properties of the tubes can be improved by grinding of the outer and inner walls of the tube before the coating step to give the tube a constant wall thickness and a constant cross-section area.

3,728,146
GLASS FIBER REINFORCED ELASTOMERS
Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Mar. 22, 1971, Ser. No. 126,821
Int. Cl. C03c *25/02*
U.S. Cl. 117—72 28 Claims

Glass fibers for use in glass fiber-reinforced elastomeric materials and methods for preparing same wherein a glass fiber bundle is first impregnated with an elastomer or resinous polymer and then is coated with an elastomer compatible material for forming an impregnated glass

fiber bundle having an inner coating comprising an elastomer or resinous polymer and an outer coating of the elastomer compatible material.

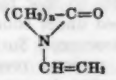
3,728,147
METHOD FOR COMBINED COATING AND COLD REDUCTION OF METAL
Walter Norman Jenkins and Terence Williams, Swansea, Wales, assignors to The British Iron and Steel Research Association, London, England
Filed Sept. 18, 1970, Ser. No. 73,350
Claims priority, application Great Britain, Sept. 23, 1969, 46,796/69
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 16 Claims



Metal sheet or strip formed through a cold mill to reduce it to substantially final gauge is coated through contact with the mill rolls, with a fluid which is capable of cross linking or of polymerisation under the action of radiation of an accelerated electron beam, X-rays or gamma rays of providing a degree of lubrication of the mill rolls. The coated strip is then subject to radiation, either directly after coating or after an intermediate storage step including for example coiling and uncoiling.

3,728,148
METHOD FOR THE PRODUCTION OF ELECTRICAL PRESSURE SENSITIVE INSULATING TAPES
Hanns Pietsch and Julius Curts, Hamburg, Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany
Filed Dec. 17, 1970, Ser. No. 99,250
Claims priority, application Germany, Dec. 24, 1969, P 19 64 747.3
Int. Cl. B44d *1/50;* C09j *7/02*
U.S. Cl. 117—93.31 11 Claims

A solution of a copolymer is applied to a base material. The copolymer comprises 65 to 90% by weight, based on total monomer weight, of at least one ester of acrylic acid with a straight or branched chain primary or secondary alcohol having 4–12 carbon atoms, 10 to 30% by weight, based on total monomer weight, of at least one N-vinyl lactam having the general formula



wherein *n* is 3, 4 or 5 and 0–20% by weight, based on total monomer weight, of at least one modifying monomer copolymerizable with the above recited monomers. The

resultant coating is dried. An electrical insulating tape comprising a pressure sensitive self-adhesive coating on a carrier material is thereby obtained. The tape has improved adhesion, cohesion and gripping capacity.

3,728,149
CHROMIZING PROCESS

James L. Forand, Jr., Bethlehem, and Paik Woo Shin, Coopersburg, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 6, 1970, Ser. No. 61,817
Int. Cl. C23c 9/00
U.S. Cl. 117—107.2 P 27 Claims

In a method of forming a corrosion resistant coating on steel strip, the strip is coated on at least one side with a uniform distribution of a chromium-containing metal powder and a considerably less amount of an alkali or alkaline earth metal halide. The powder, containing the halide, is compacted on the strip. The strip is coiled, preferably in a tight coil, and heated in a heating zone in a protective atmosphere for sufficient time and at a temperature to cause diffusion between the metal strip and metal powder, and to thus form a protective stainless steel coating on the strip.

3,728,150
BONDABLE ADHESIVE COATED POLYIMIDE FILM

Edward L. Yuan, Philadelphia, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

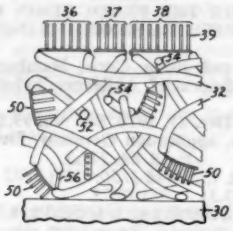
No Drawing. Filed July 12, 1971, Ser. No. 161,871
Int. Cl. B44d 1/00
U.S. Cl. 117—138.8 A 7 Claims

Caustic treated polyimide film coated with an acrylic adhesive and laminate articles made therefrom.

3,728,151
FIBER AND FABRIC TREATING

Patsy O. Sherman, Bloomington, and Samuel Smith, Roseville, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Application Jan. 15, 1968, Ser. No. 698,016, which is a continuation-in-part of abandoned application Ser. No. 614,925, Feb. 9, 1967. Divided and this application June 17, 1970, Ser. No. 57,884
Int. Cl. B44d 1/22
U.S. Cl. 117—138.8 A 11 Claims



Hybrid polymers provide sufficient oleophobicity and hydrophilicity in water so that fabrics treated therewith have increased ability to release oily stains on laundering. Oleophobic and hydrophilic moieties are combined in coatable copolymers so that the relative mobility of the moieties is assumed under some set of conditions of temperature and environment. Surfaces treated with the resulting copolymers respond reversibly to changes of environment, e.g. gaseous to aqueous milieu and vice versa, by a change in kind of properties. As a non-limiting example, fluorochemical moieties and hydrophilic polyether moieties are combined through sulfur atoms to give polymers which are applied as oil and water-repellent treatments with other, e.g. crease resistant, textile treatments. Fabrics thus treated are repeatedly launderable to remove oily stains.

3,728,152
METHOD FOR PRODUCING BUBBLE DOMAINS IN MAGNETIC FILM-SUBSTRATE STRUCTURES

Jack E. Mee, Paul J. Besser, George R. Pulliam, David M. Heinz, and Perry E. Elkins, Orange County, Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Dec. 28, 1970, Ser. No. 101,786
Int. Cl. H01f 10/02
U.S. Cl. 117—235 5 Claims

A method for producing a bubble domain in a magnetic single crystal garnet film-substrate structure is disclosed. The method involves the epitaxial deposition of an iron garnet film of the proper crystallographic orientation and having a negative magnetostriction constant on a garnet substrate in which the room temperature lattice consant of the substrate is larger than the room temperature lattice constant of the film, preferably by an amount less than 0.016 angstrom.

3,728,153
METHOD OF FORMING BUBBLE DOMAIN SYSTEM

David M. Heinz, Orange, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Dec. 21, 1970, Ser. No. 100,230
Int. Cl. H01f 10/02
U.S. Cl. 117—239 3 Claims

A method of forming a bubble domain system of magnetic material having a portion containing small diameter bubble domains and an adjacent portion having larger diameter bubble domains is disclosed. The method includes the step of providing a first single crystal magnetic film having a small bubble domain diameters therein and the further step of depositing a single crystal magnetic film having a lower magnetization level on a specific portion of said first film. The structure formed by this method has large diameter bubble domains in the portion having both of the films and small diameter bubbles in the portion having only one film.

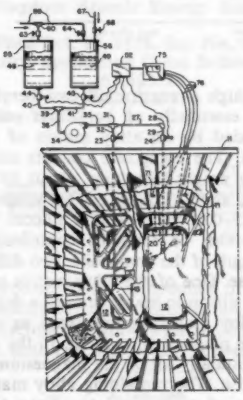
3,728,154
SEMICONDUCTOR WAFER CLEANING
Clarence K. Suzuki, San Jose, Calif., assignor to Ronald R. Maagdenberg, Sunnyvale, Calif.
No Drawing. Filed Sept. 14, 1970, Ser. No. 72,126
Int. Cl. B08b 3/08
U.S. Cl. 134—3 13 Claims

A process for cleaning semiconductor surfaces using an aqueous wash solution of dilute sulfuric acid. The dilute acid is made with ultra clean deionized water. The semiconductor surfaces to be cleaned are dipped in and out of the solution immediately after the solution is formed.

3,728,155
COPPER ALLOY CLEANING PROCESS
James A. Ford, North Haven, Conn.; Stuart R. Saunders, Kingston, England; Elmer J. Caule, New Haven, Conn., and Charles D. McLain, Alton, Ill., assignors to Olin Corporation, New Haven, Conn.
Division of Ser. No. 789,417, Jan. 6, 1969, Pat. No. 3,646,946. This application June 18, 1971, Ser. No. 154,669
Int. Cl. C23g 1/04, 1/10, 1/20
U.S. Cl. 134—3 10 Claims

A process for removing surface oxides from copper alloys. For example, those alloys which form, on annealing, Al_2O_3 and related oxides are uniquely cleaned by a process which consists of a duplex treatment requiring a first immersion in a hot alkaline solution followed by a second immersion in a hot mineral acid solution.

3,728,156
LARGE SCALE TANK CLEANING METHOD
Gordon H. Miller, Richmond, Va., assignor to Texaco Inc., New York, N.Y.
Filed Nov. 5, 1971, Ser. No. 195,951
Int. Cl. B08b 3/02, 9/08
U.S. Cl. 134—10 8 Claims

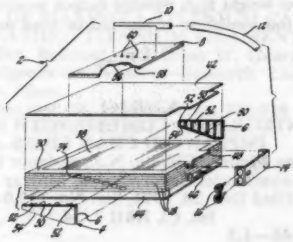


A method for cleaning large-scale tanks which are used for containing products that produce explosive mixtures upon washing out the residuals. The washing is done by high-velocity spraying which tends to cause an electrostatic charge to build up in the atmosphere within the tank. The charge is neutralized by alternating between washing fluids that build opposite polarity charges.

3,728,157
METHOD FOR CLEANING BULK TANKS
Andrew Geo. Griparis, Joliet, Ill., assignor to The Diversey Corporation, Chicago, Ill.
Original application Sept. 30, 1968, Ser. No. 763,823. Divided and this application June 22, 1970, Ser. No. 59,828
Int. Cl. B08b 9/08, 9/10
U.S. Cl. 134—22 R 3 Claims

Apparatus for spray cleaning the soiled interior surfaces of a tank by alternately: (1) applying a burst of cleansing liquid through a sprayer which directs a heavy spray mist to saturate the interior tank surfaces; and (2) enabling the applied cleansing liquid to soak for a timed interval on the tank surfaces. Portions of the apparatus can be used for cleaning pipelines associated with the tank. A tank sprayer which includes an equalization chamber for equalizing the flow of liquid around the spray head and a restricted outlet at one end of the equalization chamber to form a heavy spray mist in cleaning tank interiors. A quick drain valve for rapidly draining large amounts of liquid from a conduit including a solenoid actuated seal for selectively sealing or opening a series of drain openings around the perimeter of the valve. A liquid level indicating apparatus for indicating the drop in level below a preset level of liquid in any one of a number of closed containers each having a narrow neck for filling the container, including a detector inserted through each container neck for detecting the level changes, and a single air pressure sensor responsive to the detected changes in any of the containers for indicating a low level condition.

3,728,158
LOW SILHOUETTE BI-POLAR BATTERY
David T. Poe, Gaston, and Murray G. Sandberg, Muncie, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 16, 1971, Ser. No. 199,235
Int. Cl. H01m 39/06
U.S. Cl. 136—10 2 Claims



A low-silhouette, bi-polar-electrode battery having a plurality of stacked cells separately venting through their respective sides via a multi-channeled venting system.

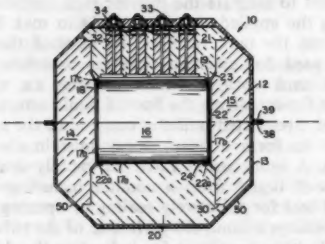
3,728,159
ELECTROCHEMICAL CELL WITH MODIFIED CRYSTALLINE DISULFIDE ELECTROCATALYSTS
Gideon M. Varga, Jr., Ho-Ho-Kus, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.
No Drawing. Filed June 4, 1971, Ser. No. 150,229
Int. Cl. H01m 27/04
U.S. Cl. 136—86 D 7 Claims

An electrochemical cell is improved when at least catalytic amounts of a modified crystalline disulfide of a Group VI–B metal is used as an electrocatalyst. The metal disulfide is modified with from 1 to 10 mole percent of a lower altervalent atom. The electrocatalyst can be used as an anode or cathode catalyst.

3,728,160
RADIOISOTOPE MEANS

Nicholas H. DesChamps, Reeds Ferry, N.H.; Charles R. Fink, Nashua, both of N.H., and John J. Sullivan, Winchester, Mass., assignors to Sanders Nuclear Corp., Nashua, N.H.

Filed Aug. 19, 1968, Ser. No. 753,344
Int. Cl. G21h 1/10
U.S. Cl. 136—202 9 Claims

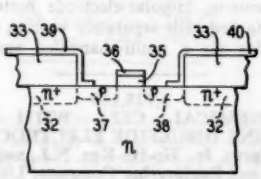


A radioisotope support structure has a fuel capsule defining a first and a second end preferably with a foil insulation surrounding the capsule and first and second insulating end sections adjacent the first and second capsule ends respectively. Means urge the end sections toward toe capsule to firmly support the capsule therebetween in fixed position with respect to the end sections. First and second end caps are interposed between the capsule and the first and second end sections respectively to distribute a pressure load on the end sections and preferably a two-part housing encloses the fuel capsule and insulation with sufficient space therein to mount means for utilizing heat generated by the fuel capsule. In the preferred embodiment, thermoelectric means are assembled within the housing to convert heat generated by the fuel capsule into electrical energy whereby the assembly provides an efficient low weight high wattage output generator. In some cases, the foil insulation is omitted or used as a heat sink means.

3,728,161
INTEGRATED CIRCUITS WITH ION IMPLANTED CHAN STOPS

Robert Alan Moline, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1971, Ser. No. 213,044
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 8 Claims

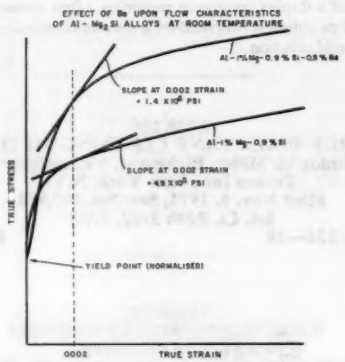


The specification describes a chan stop technique for eliminating spurious inversion of the surface of a semiconductor integrated circuit chip due to capacitive coupling between the metallization and/or the field oxide and the semiconductor. Spurious inversion is conventionally overcome by providing a low resistivity region, commonly referred to as a chan stop, uniformly under the field oxide. In making devices using ion implantation techniques, the channel or active region is first masked and the chan stop is formed by implantation or diffusion. After the field oxide is grown, the mask for forming the channel window must be aligned with the region previously masked. This alignment and the first masking step are eliminated in the process described by forming a uniform chan stop implant and compensating the chan stop impurities in the channel region by a compensation implant through the channel window. The chan stop and channel are thereby self-aligned.

3,728,162
METHOD OF PRODUCING CHILL CAST PARTICULATE COMPOSITES

Leonard B. Griffiths, North Reading, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Original application Sept. 15, 1967, Ser. No. 667,910, now Patent No. 3,558,305, dated Jan. 26, 1971, which is a continuation-in-part of abandoned application Ser. No. 597,401, Nov. 11, 1966. Divided and this application Oct. 2, 1969, Ser. No. 871,164
Int. Cl. C22f 1/16
U.S. Cl. 148—3 2 Claims


EFFECT OF Be UPON FLOW CHARACTERISTICS OF Al - Mg2Si ALLOYS AT ROOM TEMPERATURE
SLOPE AT 0.002 STRAIN = 1.4 X10⁵ PSI
SLOPE AT 0.002 STRAIN = 4.5 X10⁵ PSI
YIELD POINT (NORMALISED)
TRUE STRESS
0.002
TRUE STRAIN

A ductile and high strength chill cast beryllium composite composed essentially of beryllium particles substantially surrounded by an alloy matrix of aluminum-magnesium-silicon. The composite consists essentially of about 85–60% by weight beryllium, about 39.5–13% by weight aluminum, about 3.6–0.10% by weight magnesium, and about 1.5–0.08% by weight silicon. Within the ranges of proportions of elements contributing to the ductility and strength of the composite, two different alloy matrix species arise. One of the alloy matrix species contains an excess of silicon to magnesium to a degree whereby the matrix alloy may be categorized as silicon rich with respect to the magnesium content. In the silicon rich alloy matrix substantially all of the magnesium will combine with the silicon. The remaining alloy matrix species contains an excess of magnesium to silicon to a degree whereby the matrix alloy may be categorized as magnesium rich with respect to the silicon content. The mechanical properties of the composites embodying the silicon rich alloy matrix and the magnesium rich alloy matrix, such as ductility and strength, are outstanding; however, the ductility and strength characteristics of the composites embodying the silicon rich alloy matrix are more outstanding than the ductility and strength characteristics of the composites embodying the magnesium rich alloy matrix.

3,728,163

ALKALINE LIQUIDS FOR CLEANING METALS

Alexander Robley Morrison, Caulfield, and Heinz Dieter Herrmann, Boronia, Victoria, Australia, assignors to Balm Paints Limited, Melbourne, Victoria, Australia

No Drawing. Filed May 10, 1971, Ser. No. 142,049
Claims priority, application Australia, May 25, 1970, 1,312/70; July 31, 1970, 2,040/70
Int. Cl. C23f 7/10
U.S. Cl. 148—6.15 Z 8 Claims

Grain-refining pretreatment liquids for ferrous or zinc-containing metal surfaces, which have a pH of at least 4.5 and contain a titanium grain-refining compound are stabilised by the addition thereto of a soluble copolymer of maleic acid (anhydride), fumaric acid or citraconic acid and ethylene or a methyl, ethyl or cyclohexyl vinyl ether. The copolymers must have a viscosity as a 4% by weight solution in water of pH 9 of at least 3.5 centipoise at 25° C. A process of zinc phosphating in which the grain-refining liquid so-stabilised in a water-rinse immediately preceding a phosphating liquid is also disclosed.

3,728,164

METHOD FOR FORMING A CHEMICAL COATING ON ALUMINUM OR ALUMINUM ALLOY

Takashi Abe, Koji Aizawa, and Masanobu Oguri, Osaka, Japan, assignors to Showa Aluminium Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Sept. 23, 1970, Ser. No. 74,837
Claims priority, application Japan, Oct. 13, 1969, 44/82,122
Int. Cl. C23f 7/06
U.S. Cl. 148—6.27 1 Claim

A method for forming a chemical coating on aluminum or aluminum alloy in which the aluminum or aluminum alloy is immersed in an aqueous solution containing monoethylamine or diethylamine. The aqueous solution can be heated either before or after the addition of monoethylamine or diethylamine. After immersing, the metal may be subjected to pressurized steam.

3,728,165

METHOD OF FABRICATING A COMPOSITE SUPERCONDUCTOR

Brian Wilfred Howlett, Newbury, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 19, 1970, Ser. No. 82,414
Claims priority, application Great Britain, Oct. 27, 1969, 52,623/69
Int. Cl. C21d
U.S. Cl. 148—11.5 R 4 Claims

A15 superconductivity compounds of general formula A_3B are manufactured by forming an alloy of B in a carrier, contacting the alloy with A and heat treating so that a solid state reaction occurs between A and B.

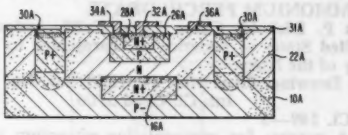
3,728,166

SEMICONDUCTOR DEVICE FABRICATION METHOD AND PRODUCT THEREBY

Paul H. Bardell, Jr., Poughkeepsie, Fred Barson, Wappingers Falls, Charles E. Benjamin, Poughkeepsie, and Raymond P. Pecoraro, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1967, Ser. No. 608,628
Int. Cl. H01l 7/34; B01j 17/00
U.S. Cl. 148—175 7 Claims

This is a method for reliably reproducing, on the surface of an epitaxially grown monocrystalline layer, a pattern that was formed on the surface of the substrate on which the epitaxial layer was grown. By using a substrate having a {100.} crystallographic orientation, the {100.} epitaxial grown layer reproduces the pattern on the substrate surface directly above the substrate surface



pattern. This permits accurate alignment that is necessary for any subsequent process operation, such as diffusion, to be accurately performed thereby increasing the yield in the manufacture of, for example, integrated semiconductor devices.

3,728,167

MASKING METHOD OF MAKING SEMICONDUCTOR DEVICE

Alan M. Garber, Boxford, Mass., assignor to GTE Sylvania Incorporated

Filed Nov. 16, 1970, Ser. No. 89,905
Int. Cl. H01l 7/02
U.S. Cl. 148—187 3 Claims

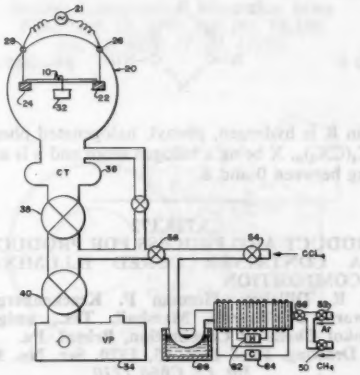
An MIS device fabricated by forming the insulating structure of the gate of a thin layer of silicon oxide and an insulating material, such as silicon nitride, aluminum oxide, or aluminum silicate. The insulating structure masks the underlying channel during diffusion of the source and drain regions. Treatment in oxygen causes a thick field oxide to be grown at the silicon surface except under the insulating structure of the gate. Thus, a thin oxide is provided for the gate structure and a thick field oxide is provided for spacing the conductive metal paths away from the underlying silicon.

3,728,168

PROCESS OF MAKING A TITANIUM CARBIDE SHEATHED TITANIUM FILAMENT

Lloyd R. Allen, Belmont, and Brian W. Geary, Boston, Mass., assignors to National Research Corporation, Cambridge, Mass.

Filed Oct. 28, 1968, Ser. No. 771,010
Int. Cl. C21d 1/56, 1/74
U.S. Cl. 148—20.3 4 Claims



Titanium filaments are carburized to produce a thick titanium carbide sheath and a central core of titanium

metal with a dispersed strengthening phase. The resultant product is incorporated into a metal matrix to provide a composite of improved strength and stiffness.

3,728,169

ENCAPSULATION OF NITRONIUM PERCHLORATE EMPLOYING AMMONIA TO FORM AMMONIUM PERCHLORATE

James P. Diebold, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Mar. 18, 1963, Ser. No. 266,105
Int. Cl. C06d 5/06
U.S. Cl. 149—5 5 Claims

1. A process for encapsulating nitronium perchlorate comprising the step of

flowing ammonia diluted with an inert gas over nitronium perchlorate particles.

3,728,170

PLASTIC-BONDED EXPLOSIVE COMPOSITIONS AND THE PREPARATION THEREOF

Barbara A. Stott, Ridgecrest, and Dino A. Sbrocca, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Sept. 6, 1962, Ser. No. 222,262
Int. Cl. C06d 5/06
U.S. Cl. 149—19 8 Claims

1. A plastic-bonded explosive composition comprising a high explosive selected from the group consisting essentially of diaminotrinitrobenzene, cyclotetramethylenenitramine, and mixtures thereof, the copolymer of vinylidene fluoride and perfluoropropene and a synthetic organic silicone resin.

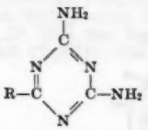
3,728,171

STABILIZED PROPELLANT COMPOSITIONS AND METHODS FOR THEIR PREPARATION

Larry P. Bundy, Brigham City, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed July 12, 1965, Ser. No. 471,795
Int. Cl. C06d 5/06
U.S. Cl. 149—19 31 Claims

Certain compositions, added to a high energy oxidizer, hydrazinium perchlorate, and a hydrocarbon polymeric fuel binder in a solid propellant formulation whereby said propellant is rendered curable to an elastomeric composition having good flexibility and hardness, where previously said propellant overcured to a hard and brittle material. The compositions are "stabilizers," having diverse structural forms representatively set forth below:



wherein R is hydrogen, phenyl, halogenated phenyl and/or $CX_4(CX_2)_n$, X being a halogen atom and n is an integer ranging between 0 and 8.

3,728,172

PRODUCT AND PROCESS FOR PRODUCING A CONTAINER CURED ILLUMINANT COMPOSITION

David R. Dillehay, Herman F. Krackenberger, and Howard C. Havron, Marshall, Tex., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Dec. 15, 1970, Ser. No. 98,481
Int. Cl. C06d 1/10
U.S. Cl. 149—19 28 Claims

Illuminant fuels and oxidizers are added to crushable capsules containing curable, illuminant binders and to crushable capsules containing curing agents for the illuminant binders to form a homogeneously mixed, flowable powder, illuminant composition. This composition is dispensed into illuminant containers where a capsule rupturing pressure is applied rupturing the capsules in the composition. This results in the liquid binders and liquid curing agents being released and dispersed throughout the composition and interacting and forming a container cured illuminant.

3,728,173

DENSE EXPLOSIVE SLURRY COMPOSITIONS OF HIGH ENERGY CONTAINING A GUM MIXTURE

Melvin A. Cook, Lex L. Udy, and Albert G. Funk, Salt Lake City, Utah, assignors to Intermountain Research & Engineering Co., Inc.

No Drawing. Filed Oct. 17, 1969, Ser. No. 867,388
Int. Cl. C06b 1/00
U.S. Cl. 149—21 10 Claims

A dense explosive composition of high energy is made up in heavy slurry form primarily of concentrated aqueous solution of a perchlorate, preferably sodium perchlorate, finely divided metallic aluminum, a self-explosive such as TNT or RDX, and a long term stable thickener comprising a guar gum or starch in combination with a xanthan gum. Sodium nitrate may be added to reduce fudge point.

3,728,174

GELATIN EXPLOSIVE CONTAINING HOLLOW RESINOUS PLASTIC SPHERES

Walter L. Reinhart, Westtown Township, Chester County, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 458,973, Sept. 28, 1954. This application Nov. 2, 1955, Ser. No. 544,579
Int. Cl. C06b 1/04
U.S. Cl. 149—21 16 Claims

1. A gelatin explosive including, in its formula, hollow resinous nitrogen filled plastic pellets which are not attacked by other ingredients of the explosive and are of a size such that they pass a U.S.S. No. 8 screen, said pellets being included in an amount between about 0.1% and about 3% by weight.

3,728,175

SLURRY EXPLOSIVES

William Allan Craig, Glasgow, Scotland, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 8, 1971, Ser. No. 196,796
Int. Cl. C06b 1/04
U.S. Cl. 149—29 9 Claims

Slurry explosives comprising as thickener a Xanthomonas hydrophilic colloid cross-linked with an oxide of an element in a pentavalent or hexavalent state, for example antimony V, tellurium VI or chromium VI or an acid produced from the oxide or an alkali metal salt of such acid, the acid produced from the oxide having a dissociation constant $K<1.0$ in 0.1 to 0.01 N aqueous solution.

3,728,176

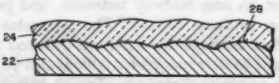
METHOD OF CAUSING ADHERENCE OF GLASS TO GOLD

John Francis Osborne, Tempe, and Hans Joachim Pille, Mesa, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 30, 1971, Ser. No. 139,051
Int. Cl. C23f 1/00
U.S. Cl. 156—3 6 Claims

In Large Scale Integrated (LSI) technology, very complex circuits are manufactured which require at least two layer metallization patterns and often require three layers of metallization patterns in making all the interconnections among the transistors, diodes, resistors, etc. devices employed. Adjacent metallization layers are separated by silicon dioxide, SiO_2, phossil glass P-SiO_2 and other dielectric materials. Through connections between layers

are made by opening apertures in the intervening dielectric material and forming the next layer of metal over the dielectric layer, which metal layer includes a member extending through the aperture and into contact with either an underlying layer of metal or the above mentioned devices themselves. When gold is selected as the



metallization, an additional intermediate layer is now required for interfacing with the dielectric material since dielectric materials have not heretofore adhered directly to gold. The present invention is directed toward eliminating the need for this intermediate layer and having the dielectric material to adhere directly to the gold.

3,728,177

METHOD OF PRODUCING A FLEXIBLE LAMINATE COPPER CIRCUIT

Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation

No Drawing. Original application July 30, 1970, Ser. No. 59,684, now Patent No. 3,677,828. Divided and this application May 27, 1971, Ser. No. 147,672

Int. Cl. H05k *3/06*

U.S. Cl. 156—3 **9 Claims**

A method of producing a laminate having high bond strength and excellent resistance to acid undercutting comprising oxidizing copper or its alloys to form an oxide film, applying a phosphoric acid solution to the oxide film, rinsing, drying, and adhesively laminating to a plastic film. The instant case also teaches a method of producing high tarnish resistance on copper and its alloys by so oxidizing and phosphating and further teaches a flexible printed circuit wherein the unwanted copper portion of the formed laminate is etched away, characterized by high peel strength and substantially no acid undercutting of the formed circuitry.

3,728,178

METHOD OF PRODUCING FLEXIBLE COPPER LAMINATE FOR PRINTED CIRCUITS

Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation

No Drawing. Original application July 30, 1970, Ser. No. 59,684, now Patent No. 3,677,828. Divided and this application May 27, 1971, Ser. No. 147,674

Int. Cl. H05k *3/06*

U.S. Cl. 156—3 **6 Claims**

A method of producing a laminate having high bond strength and excellent resistance to acid undercutting comprising oxidizing copper or its alloys to form an oxide film, applying a phosphoric acid solution to the oxide film, rinsing, drying, and adhesively laminating to a plastic film. The instant case also teaches a method of producing high tarnish resistance on copper and its alloys by so oxidizing and phosphating and further teaches a flexible printed circuit wherein the unwanted copper portion of the formed laminate is etched away, characterized by high peel strength and substantially no acid undercutting of the formed circuitry.

3,728,179

METHOD OF ETCHING SILICON CRYSTALS

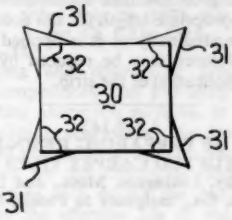
Jimmy Lee Davidson, Melbourne Beach, and Donald R. Mason, Indialantic, Fla., assignors to Radiation Incorporated, Melbourne, Fla.

Filed May 20, 1970, Ser. No. 39,092

Int. Cl. H01l *7/50*

U.S. Cl. 156—8 **2 Claims**

A technique for making dielectrically isolated semiconductive devices on a single crystal silicon substrate, employing an etchant consisting of water, an amine and a complexing agent. The etchant acts on a silicon wafer cut from a single crystal at differing etch rates for three structural axes of the silicon crystal structure to form moats. By properly selecting moat orientation it is possible to substantially avoid undercutting of a masking oxide



used to determine the geometrical pattern which is etched on the silicon wafer, and to shape the moat angles. The reduction of undercutting permits closer spacing of the pattern which is etched on the wafer, resulting in a significantly increased component density, and the angularity of the moat permits forming of smaller islands than has been feasible in the past.

3,728,180

POWDERLESS ETCHING BATH COMPOSITIONS

Harold J. Messerschmidt, Stockholm, Karl Heyman, Montclair, and Bernadou W. Johnsen II, Paterson, N.J., assignors to Mona Industries, Inc., Paterson, N.J.

No Drawing. Filed Mar. 29, 1972, Ser. No. 239,384

Int. Cl. B44m *3/02;* **C23g** *1/26*

U.S. Cl. 156—14 **18 Claims**

Powderless etching bath additive compositions, especially for etching photoengraving plates of magnesium, zinc or alloys thereof, containing

(a) a water soluble or dispersible sulfonated fatty acid of from 8 to 24 carbon atoms, and

(b) at least one saturated or olefinically unsaturated monocarboxylic acid of from 8 to 24 carbon atoms,

and etching baths also containing nitric acid and water, gives good etching performance, particularly decreased lateral etching and better side wall protection of the resist.

3,728,181

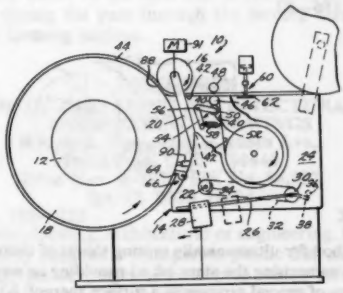
APPLICATION OF TREAD STRIP TO TIRE CASING

Kenneth I. Simmons, Jr., Hartford City, Ind., assignor to Bandag Incorporated, Muscatine, Iowa

Filed Sept. 28, 1970, Ser. No. 76,195

Int. Cl. B29h *17/02, 17/06*

U.S. Cl. 156—96 **8 Claims**



A precured rubber retread strip is applied to a prepared tire casing mounted for rotation about its axis by press-

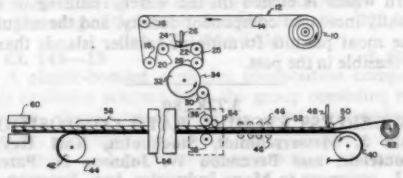
ing the leading edge of a continuous tread strip against the tire periphery with a cold vulcanizing bonding medium disposed between the tire and the strip, driving either the tire or strip to cause rotation of the tire and wrapping of the strip around the tire, sensing the arrival of the leading edge of the strip at a predetermined point and cutting the strip in response to the arrival of the leading edge of the strip at a predetermined location so as to produce a strip of the appropriate length for the tire. The strip may be stretched longitudinally as it is applied to the tire or the tire circumference may be reduced by spreading the beads prior to application of the strip.

3,728,182

METHOD OF PREPARING RESIN-BACKED TUFTED CARPET TILES

Reuben Wisotzky, Lexington, Mass., and David K. Slosberg, Atlanta, Ga., assignors to Pandel-Bradford, Inc., Lowell, Mass.

Filed June 25, 1971, Ser. No. 156,830
Int. Cl. B32b 5/02
U.S. Cl. 156—72 **20 Claims**



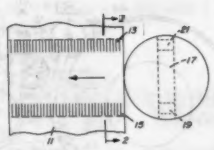
A method of preparing dimensionally stable solid vinyl resin-backed carpet tiles characterized by a fibrous face, which method comprises: laying the surface of a precoated tufted carpet under pressure between opposing rolls having a fixed adjustable gap therebetween onto the wet surface of a heavily loaded vinyl resin plastisol layer deposited on a release surface while maintaining a rolling bank of a liquid resinous material at the nip of the opposing rolls during the laying process; fusing the heavily loaded vinyl resin layer to the back of the carpet; cooling the fused layer; stripping the fused layer from the release surface; and cutting the solid vinyl resin-backed carpet so prepared into carpet tile sections.

3,728,183

METHOD OF AND APPARATUS FOR ULTRASONIC SPLICING

Walter C. Wasco; Charles W. Pierson, both of Rochester, and Leonard E. Pagnard, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 19, 1971, Ser. No. 126,091
Int. Cl. B29c 27/08
U.S. Cl. 156—73 **7 Claims**



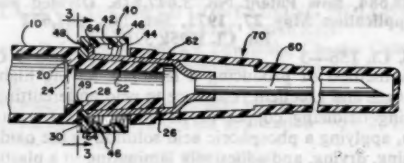
A method for ultrasonically uniting sheets of thermoplastic material comprising the steps of: a) providing an anvil having a plurality of spaced grooves in a surface thereof; b) positioning said sheets in superposed relationship on said anvil and covering said grooves; and c) traversing an ultrasonically vibrating horn across said grooves, and in contact with the area of said superposed sheets which covers said grooves and the surface of said anvil between said grooves. This method is of particular value when an electrically conductive metal coating is to be preserved across the spliced area. Two parallel spaced splices can be performed with a single ultrasonic horn having two pads designed to traverse two rows of grooves simultaneously. The ultrasonic horn should be mounted for pivoting about an axis midway between, and parallel to the rows, to assure uniform contact. The apparatus comprises a motor propelled carriage for the horn adapted for back and forth movement so that successive splices can be made during movements in opposite directions. Tracks at opposite ends of the anvil are provided for wheels to ride on to remove the horn from the work upon completion of a splice.

3,728,184

METHOD OF MAKING SYRINGE AND NEEDLE ADAPTER ASSEMBLY BY ULTRASONIC BONDING

George K. Burke, and Kenneth Raines, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Division of Ser. No. 32,789, April 29, 1970, Pat. No. 3,638,650. This application Aug. 26, 1971, Ser. No. 175,310
Int. Cl. B29c 27/08
U.S. Cl. 156—73 **2 Claims**



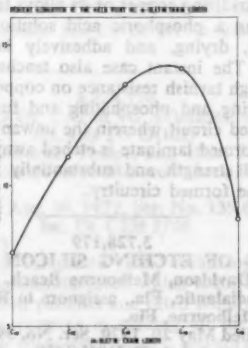
A needle adapter is supported in surrounding relationship to the boss on a syringe and has attaching portions to mount a hypodermic needle having attaching flanges on the hub thereof. The needle adapter includes a plurality of tapered spaced portions which are ultrasonically fused to spaced portions of the annular shoulder on the barrel of the syringe surrounding a boss extending therefrom.

3,728,185

OLEFIN-SO_2 COMPOSITIONS CONTAINING FINELY DIVIDED FUSIBLE INORGANIC MATERIAL AND METHOD FOR BONDING THEREWITH

Don N. Gray, Sylvania, Ohio, assignor to Owens-Illinois, Inc.

Filed May 22, 1970, Ser. No. 39,769
Int. Cl. B32b 31/26; C08f 13/06
U.S. Cl. 156—89 **18 Claims**



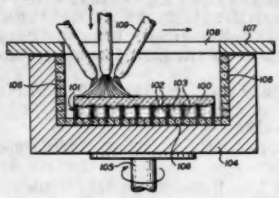
Compositions comprising a pyrolyzable olefin-SO_2 polymer having uniformly distributed therethrough a finely

divided inorganic fusible or sinterable material, for example, sealing glass. The composition can be extruded into tape form, the tape applied to a surface or between surfaces, and then heated to a temperature sufficient to pyrolyze the polymer into gaseous components and also sufficient to sinter or fuse the inorganic particulate material onto the surface or surfaces.

3,728,186
OPTICAL ELEMENTS

Heinrich Mohn, Hailer, Kreis, Germany, assignor to Heraeus-Schott Quarzschmelz G.m.b.H., Hanau, Germany

Division of application Ser. No. 825,087, Mar. 20, 1969, and a continuation-in-part of applications Ser. No. 491,525, Sept. 30, 1965, and Ser. No. 630,147, Sept. 23, 1966, all now abandoned. This application Nov. 27, 1970, Ser. No. 106,230
Claims priority, application Germany, May 21, 1965, H 52,128
Int. Cl. C03b *29/02, 11/08;* G02b *5/08*
U.S. Cl. 156—153 **5 Claims**

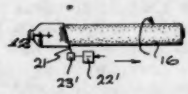


Method of forming a lightweight optical structure such as a mirror or window made up of an optical plate of quartz fused to a perforated support plate of quartz or fused silica by placing the optical plate on the perforated support plate in such position that the rear surface of the optical plate covers the perforation openings; and directing a high intensity, high temperature source of radiant heat onto the optical surface of the optical plate whereby to preferentially heat the areas of contact between the optical plate and the walls of the perforated support to selectively fuse such areas and to cause a portion of the rear face of the optical plate to deform and convexedly depend into the perforations of the support plate. The resulting optical structure is also described.

3,728,187
METHOD OF APPLYING ALTERNATE LAYERS OF PLASTIC FOAM AND GLASS FIBERS TO A METAL TUBE

Andrew R. Martin, 1782 Plaza Del Amo, Torrance, Calif. 90501

Filed Oct. 26, 1970, Ser. No. 83,798
Int. Cl. B31c *13/00;* B65h *81/00;* F16l *59/00*
U.S. Cl. 156—162 **7 Claims**



Alternate layers of plastic foam and glass fiber fabric between inner and outer moisture impervious walls of glass fiber filament-wound plastic layers forming a unitary jacket applied over a metal tube with a substance between the tube and the jacket preventing adherence of the jacket to the tube.

3,728,188
CHROME-FREE DEOXIDIZING AND DESMUTTING COMPOSITION AND METHOD

Robert Warren Yarrington, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

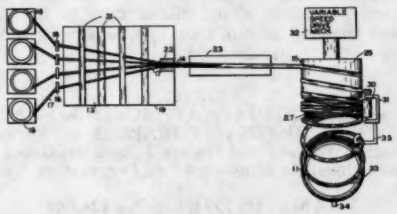
No Drawing. Filed July 29, 1971, Ser. No. 167,513
Int. Cl. C23g *1/15*
U.S. Cl. 156—22 **7 Claims**

A deoxidizing and desmutting process, employing chrome-free compositions and providing improved solutions for treating aluminum surfaces, in preparation for subsequent finishing operations. The invention, in both its method and composition aspects, involves preventing smut formation on the deoxidized aluminum surface, controlling surface etch during the deoxidizing process, and prolonging the effective life of the aqueous acidic deoxidizing solution.

3,728,189
METHOD AND APPARATUS FOR FABRICATING A PLURALITY OF FILAMENTS INTO A HELIX

George John Hannes, Maumee, James William Helmick, Toledo, James Arnold Dennis, Perrysburg, and John Marvin Current, Jerry City, Ohio, assignors to Johns-Manville Corporation, New York, N.Y.

Filed June 6, 1969, Ser. No. 830,949
Int. Cl. B29h *9/02;* B65h *81/00*
U.S. Cl. 156—173 **4 Claims**



Method and apparatus for producing a helix by pulling a plurality of filaments through a resin bath, over a tensioning means through an orifice, and through a heating section for a first stage cure. The partially cured strand is drawn around a heated, stationary, helical forming surface upon which it is cured to mechanically stable form. The forming surface establishes the pitch of the helix, its inside diameter and the cross section of each turn. A drive hub having a knurled surface to frictionally engage the inner diameter of the cured helix is axially aligned with the forming surface and is driven at a suitable speed to enable the resin filled strand to be precured and finally cured in the time and at the temperature developed during the pass through the heating section and over the forming surface.

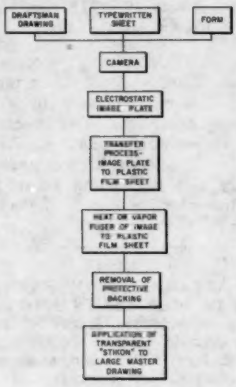
3,728,190
METHOD OF PREPARING ARCHITECTURAL AND ENGINEERING DRAWINGS

Robert E. Clay, 8260 E. 105th Ave., Henderson, Colo. 80640

Filed Nov. 2, 1970, Ser. No. 86,102
Int. Cl. B32b *31/04*
U.S. Cl. 156—235 **3 Claims**

A master drawing, architectural or engineering, to which is adhesively attached a transparent plastic film sheet having an acetate or polyester base onto which informative matter supplemental to the subject of the master drawing has been transferred from a manually drafted and typed master copy by an electrostatic or xerographic type

process. The film sheet has a pressure sensitive backing protected by a wax type paper sheet. After removal of the protective sheet, the film sheet is applied by pressure to the master drawing and appears as an integral part thereof, with the transferred matter in clean sharp lines and letters which do not become smeary when handled in use. The process of preparing drawings embodying my


DRAFTSMAN DRAWING
TYPEWRITTEN SHEET
FORM
CAMERA
ELECTROSTATIC IMAGE PLATE
TRANSFER PROCESS-IMAGE PLATE TO PLASTIC FILM SHEET
HEAT OR VAPOR FUSER OF IMAGE TO PLASTIC FILM SHEET
REMOVAL OF PROTECTIVE BACKING
APPLICATION OF TRANSPARENT "STIKON" TO LARGE MASTER DRAWING

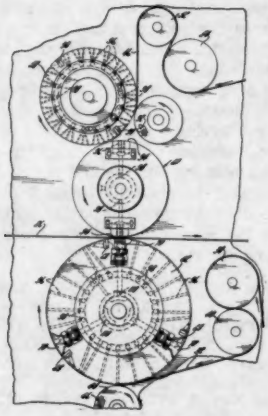
invention includes the steps of manually preparing a master copy containing informative matter supplemental to a master drawing, transferring same by electrostatic or xerographic process with either vapor or heat fusion of a powdered ink image of the master copy to the plastic film, and applying the film sheet by means of its adhesive backing to the master drawing.

3,728,191

WAISTBAND TAPE APPLICATION FOR DISPOSABLE DIAPERS

Anthony R. Wierzba and Harvey J. Spencer, Green Bay, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 19, 1971, Ser. No. 126,003
Int. Cl. B32b *31/10*
U.S. Cl. 156—265 **25 Claims**



A tape applicator for applying transversely extending strips of adhesive tape at predetermined intervals along the edge of a moving web of material such as disposable diaper stock, and for simultaneously applying release coated covered tabs over the strips of tape. The tape applicator may utilize either wide tape cut into short segments or, with an appropriate change of gear ratios, may use narrow tape cut in long segments to take advantage of the longitudinal strength properties of certain types of tape material. In the latter case, the long narrow tape segments are re-oriented and applied to extend transversely from the edge of the web material.

3,728,192

RUBBER-METAL ADHESION USING HALOGENATED QUINONE AND RESORCINOL-ALDEHYDE CONDENSATION PRODUCT

Robert W. Kindle, Cheshire, and Robert R. Barnhart and Philip T. Paul, Naugatuck, Conn., assignors to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Apr. 5, 1971, Ser. No. 131,470
Int. Cl. B32b *15/02, 15/06*
U.S. Cl. 156—306 **7 Claims**

The adhesion of rubber to metal (e.g., wire tire cord) is improved by incorporating a halogenated quinone (e.g., chloranil) and a resorcinol-aldehyde condensate (e.g., condensation product of resorcinol and acetaldehyde) into the rubber.

3,728,193

TERTIARYBUTYLSTYRENE/BUTADIENE BLOCK COPOLYMERS AS ADHESIVES

Leland Dennis McKeever and Wen-Jiu Cheng, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,205
Int. Cl. C09j *3/00;* **B32b** *27/06*
U.S. Cl. 156—334 **5 Claims**

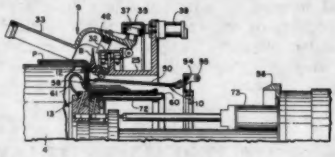
Adhesive copolymers of tertiarybutylstyrene and butadiene which show high adhesive strength are polymers which contain 1 to 50 weight percent tertiarybutylstyrene, 99 to 50 weight percent butadiene and have inherent viscosities of from 0.5 to 4 deciliters per gram.

3,728,194

ROTATING EXPANDABLE PLY RING MECHANISM

George E. Enders, Salem, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Nov. 27, 1970, Ser. No. 93,103
Int. Cl. B29h *17/16, 17/22*
U.S. Cl. 156—400 **19 Claims**



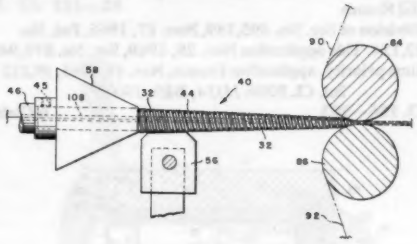
Ply ring mechanism consists of a plurality of ring segments which are adapted to be disposed adjacent the ends of a tire building drum for supporting the overhanging ply edges during stitching of the plies together. The ply ring segments are pressed into frictional engagement with the ends of the drum for rotation therewith during wrapping of the plies around the drum and subsequently retracted to provide adequate clearance for the ply turndown, ply turn-up and other operations. The ply ring segments are also pivotally mounted at their axial outer ends to permit the ring segments to be expanded radially outwardly to clear the tire beads stored therein and adjacent end of the drum when setting the tire beads against the turned-down ply edges, such ply ring segments having a stepped contour to accommodate the long flippers on the beads during wrapping of the tire plies around the drum and ply ring segments disposed adjacent the ends of the drum.

3,728,195

APPARATUS FOR THE PRODUCTION OF NON-WOVEN NET FABRICS

Milton M. Bolles, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 10, 1969, Ser. No. 798,044
Int. Cl. D04h 3/04
U.S. Cl. 156—441 2 Claims



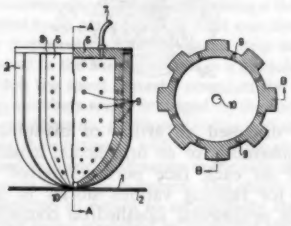
An improved apparatus for forming textile non-woven net fabrics composed of a sheet of weft threads adhesively secured to one or more sheets of warp threads, the weft sheet being formed by continuously winding a thread about a pair of spaced thread supporting screws to form a plurality of reaches therebetween, and wherein the screws are rotated about their longitudinal axes such that the helically threaded surface of the screws support the loop ends of the thread reaches to laterally advance the reaches in spaced relation along the screws to form the weft sheet.

3,728,196

APPARATUS FOR PRODUCING A PACKAGING CONTAINER COMPRISING A CONTAINER BODY OF THERMOPLASTIC MATERIAL AND A METAL FOIL LINING INSERTED INTO THE CONTAINER BODY

Anders Ruben Rausing, Blentarp, Sweden, assignor to Sabrefina SA, Fribourg, Switzerland

Original application Sept. 9, 1968, Ser. No. 758,433, now Patent No. 3,616,033. Divided and this application Mar. 17, 1971, Ser. No. 125,348
Claims priority, application Sweden, Sept. 25, 1967, 13,129/67
Int. Cl. B31f 1/00
U.S. Cl. 156—443 4 Claims



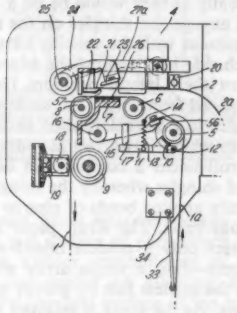
Apparatus for providing a themoplastic container with a metal foil lining by shaping the metal foil lining as it is inserted into the container by forming overlapping folds of the foil so it will conform to the shape of the inner walls of the container.

3,728,197

SPLICING APPARATUS FOR SPLICING THE ADHESIVE LEADING END OF A WAITING WEB ONTO A RUNNING WEB

Richard William Harris and John Handley, London, England, assignors to Molins Machine Company Limited

Filed Dec. 8, 1970, Ser. No. 96,172
Claims priority, application Great Britain, Dec. 10, 1969, 60,374/69
Int. Cl. B31f 5/06; B65h 19/16
U.S. Cl. 156—506 10 Claims



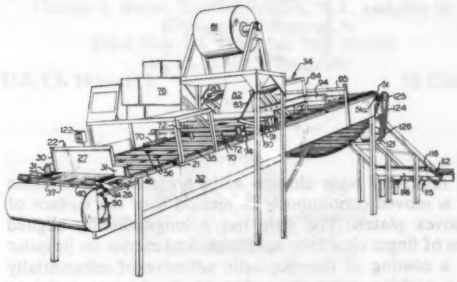
A splicing arrangement in which a new wrapper web is spliced to a nearly-exhausted old web by means of adhesive tape, there being slack in the new web at the time of splicing, and when the splice has been made the old web is driven by driving rollers at a point downstream of the splicer faster than it is being consumed until the splice has passed the driving means and the slack in the new web is taken up, the driving at the higher speed then serving to accelerate the reel of the new web. When the reel has reached working speed the drive is discontinued.

3,728,198

APPARATUS FOR PACKAGING ROOFING ELEMENTS AND PROCESS

Boyce Robert White, Orlando, Fla., assignor to Boyce Robert White, Inc., Orlando, Fla.

Continuation-in-part of application Ser. No. 760,765, Sept. 19, 1968, now Patent No. 3,566,562. This application Jan. 19, 1970, Ser. No. 3,717
Int. Cl. B32b 31/10; E04d 15/07
U.S. Cl. 156—552 3 Claims



A plurality of asphalt shingles, customarily having dimensions one by three feet and cut-outs spaced a foot apart, are stacked in an inverse cupped disposition. The stack so-cupped is placed on a shingle feed device disposed over an endless belt-like member which has parallel spacing bars disposed perpendicular to the direction of travel of the endless member and which are spaced apart five inches from leading edge to leading edge. Each spacing

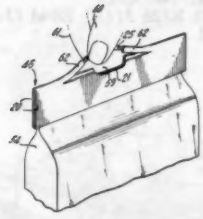
bar slices off the lower of the cupped shingles held in the feed device which are carried therefrom by the endless member, a single shingle being carried by each spacing bar whereby each shingle is overlapped by the following shingle the same amount as would occur on a roof except that the shingles are inverted and, at this point, not staggered laterally. Under the overlapped shingles, a pair of diverging chains have stagger plates extending outwardly therefrom, the chains moving at about the same speed as the endless member so that the stagger plates each engage one of the cut-out portions of each shingle and cause the shingles to move alternately outwardly so as to be staggered laterally as they would be on a roof. Resiliently biased fingers engage the shingles on the moving member to ensure alignment with the spacing bars and a series of rollers on each side bear against the edges of the shingles finely to adjust their lateral position. Hot, quick acting glue is then applied from above the endless member to the exposed shingles in a predetermined pattern and extensible Kraft paper which is two feet in width is applied from an overhead roll under a compression belt to the center of the array of shingles whereby the shingle array is glued by intermittently applied beads of glue to the Kraft paper on a continuous basis. The Kraft paper is thereafter cut so as to connect only a predetermined number of shingles—say twenty—into a single array which are moved off the end of the endless belt by gravity and down a slide into a container. As the array is received in the container, the paper automatically folds between the individual shingles in an accordion-like manner. The container is inverted and secured, and the array, when opened, may be easily extended on the roof deck to its desired position. In a modification, the desired stagger plates can be on a converging chain under the endless member and brought to bear against the edges of the shingles rather than the cut-outs. In any event, the cut-outs can be a slit rather than spaced slots and the shingles need not be of the asphalt type.

3,728,199

TAPE APPLYING APPARATUS

Alexander J. Stanley, New Brunswick, N.J., assignor to Nabisco, Inc.

Filed May 17, 1971, Ser. No. 144,026
Int. Cl. B31f *5/00*
U.S. Cl. 156—554 **6 Claims**



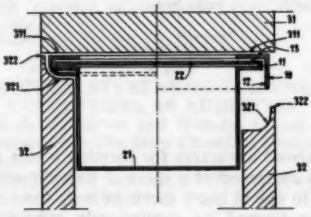
A relatively wide closure strip, preferably of metallic foil, is moved continuously in tension over the surface of a convex platen. The strip has a longitudinally aligned series of finger clearance apertures, and carries on its outer face a coating of thermoplastic adhesive of substantially lower melting point than that of the bag material to which the closure is to be applied. A narrow tearing tape is continuously fed over the platen in contact with the coated face of the strip and closely adjacent the common center line of the apertures, so that the tape spans the holes longitudinally. The inner zone of the platen immediately underlying the tape is maintained at a heating temperature sufficient to melt the plastic adhesive, thereby heat sealing the tape to the closure strip. An air jet cools the sealed joint, completing conversion of the strip and tape to a permanently composite web. The strip is hinge creased or serrated along the center line of the apertures to facilitate accurate subsequent folding, and the composite web is delivered either to storage reels or directly to packaging apparatus, as desired.

3,728,200

APPARATUS FOR PRODUCING A SEALING JOINT BETWEEN THIN SHEETS

Jacques Peyraud, Cachan (Val De Marne), France, assignor to Societe Centrale Des Emballages Aluminum (Cebal) Paris, France

Division of Ser. No. 595,159, Nov. 17, 1966, Pat. No. 3,522,124. This application Nov. 28, 1969, Ser. No. 879,949
Claims priority, application France, Nov. 19, 1965, 39,112
Int. Cl. B30b *15/34*; B29c *19/02*
U.S. Cl. 156—583 **6 Claims**



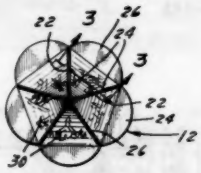
Apparatus for the joinder of edge portions of sheet material into a sealing joint by arranging sheets with edge portions to be joined in aligned superposed relation and providing a blank of thermoplastic material having a shape and dimension corresponding to the shape and dimension of the edges to be joined including first and second platen elements movable toward and away from one another and shaped to contact and fold said blank about the edges of said sheets.

3,728,201

THEMATICALLY ILLUSTRATED ICOSAHEDRON ASSEMBLAGE AND METHOD OF ASSEMBLY

Frank J. Stroehmer, 2315½ S. Catalina, Los Angeles, Calif. 90007

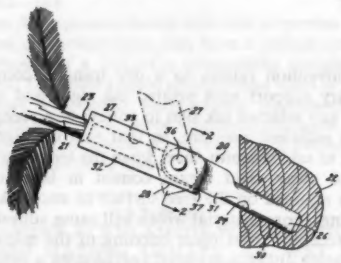
Continuation-in-part of abandoned application Ser. No. 875,423, Feb. 6, 1970. This application July 27, 1971, Ser. No. 166,570
Int. Cl. A47g *33/08*; B32b *3/04, 31/18*
U.S. Cl. 161—14 **8 Claims**



There is disclosed an article of manufacture and a method of assembly for an ornamental icosahedron having printed on each face portion thereof a thematic illustration for relating various stories in a sequential manner. The ornamental icosahedron comprises a multiplicity of circular sheets of paper or other similar material, each of said sheets having scored lines in the shape of a triangle within the circumference of the circular sheet, each scored line of the triangle and its related arc portion of the circumference of the sheet defining a segmented foldable area having an adhesive material formed thereon, each segment also being numerically marked in a sequential manner to correspond to other

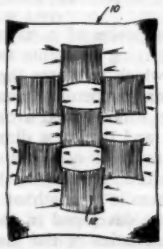
sequentially marked segments of other sheets, whereby said segmented areas are secured to matching segments, thus forming an ornamental icosahedron as a single unit.

3,728,202
HINGE TYPE BRANCH HOLDER FOR ARTIFICIAL TREE
Ammon Baus, Philadelphia, and Frederick C. Keller, Cornwells Heights, Pa., assignors to Carey-McFall Company, Philadelphia, Pa.
Filed May 10, 1971, Ser. No. 141,505
Int. Cl. A41g *1/00*
U.S. Cl. 161—24 **6 Claims**



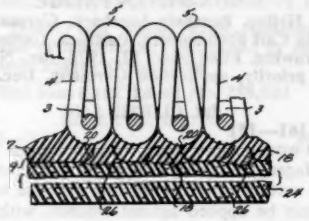
A connector for connecting a simulated branch to an artificial trunk, the connector including a branch holder, and a trunk attachment member, and pivot means swingably connecting together the branch holder and trunk attachment member.

3,728,203
PATTERNED COMPOSITE MATERIAL
Louis N. Taylor, North Miami Beach, Fla., assignor to Lou Taylor, Inc., Hialeah, Fla.
Filed May 28, 1971, Ser. No. 148,111
Int. Cl. B32b *3/16, 3/00*
U.S. Cl. 161—39 **18 Claims**



A patterned composite material comprising a flexible sheet material adapted to be gathered in at least one direction with at least three rectangularly shaped elastic strip members individually applied to the sheet material in a stretched secured condition so that the sheet material connects the strip members. The strip members are so arranged on the sheet material that two strip members are positioned in line and spaced apart to form a space therebetween, with at least one strip member being positioned in a spaced distance to the side of the center axis of said two in line strip members. The elastic strip members are constructed to return to substantially their original dimensions after being stretched to carry the sheet material into a gathered configuration so that the plurality of elastic strip members forms a gathered composite pattern on the sheet material with the areas of the sheet material opposite the elastic strip members being gathered by the constrictive action of the plurality of elastic members and the adjacent areas to the elastic member secured areas being slightly depressed in relation to the plane of the areas opposite the elastic members.

3,728,204
TEXTILE PRODUCT AND PROCESS FOR MAKING SAME
William H. Cochran II, P.O. Box 32, Stonington, Conn. 06378
Continuation-in-part of application Ser. No. 765,267, Oct. 4, 1968. This application Mar. 17, 1970, Ser. No. 20,200
Int. Cl. D03d *27/00*; D04h *11/00*
U.S. Cl. 161—66 **11 Claims**

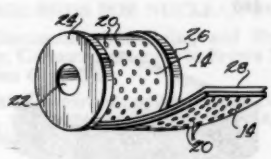


An antistatic and flame retardant textile product having a base and a pile surface of yarn which is susceptible to the generation and/or accumulation of static charge and/or having the quality of allowing flame spread, an adhesive on the opposite surface of the textile product and an electrically and thermally conducting, static-dissipating metal foil bonded to the opposite surface of the product by means of the adhesive.

3,728,205
ANTISTATIC POLYMER COMPOSITION
Gordon D. Brindell, Crystal Lake, Ill., and Leland E. Dannals, Waterbury, Conn., assignors to Uniroyal, Inc., New York, N.Y.
No Drawing. Original application Oct. 17, 1969, Ser. No. 867,410, now Patent No. 3,658,744. Divided and this application Aug. 13, 1971, Ser. No. 171,732
Int. Cl. B32b *7/00*
U.S. Cl. 161—67 **10 Claims**

Polymer compositions are provided which are sufficiently electrically conductive so as to inhibit the build-up of electrostatic charges. The compositions contain an effective amount of an antistatic agent selected from the group consisting of alkali metal salts of organic acids or mixtures thereof with or without at least one polyhydric alcohol.

3,728,206
THERMOPLASTIC SUPPORTIVE STRUCTURE
George J. Buese, East Brunswick, N.J., assignor to Johnson & Johnson
Filed Nov. 23, 1970, Ser. No. 92,096
Int. Cl. B32b *3/10, 3/26*
U.S. Cl. 161—112 **10 Claims**



This composite supportive structure comprises a web of open-cell, resilient non-thermoplastic foam, such as polyurethane foam, containing within the same a matrix of foam-like thermoplastic material, such as trans-1,4-polyisoprene, which is cohesive and sufficiently plastic at elevated temperatures to be readily moldable and yet crystallizable into a rigid structure at room temperature. The foam-like thermoplastic matrix is present in sufficient

quantity and distributed throughout the cellular structure of the web so as to substantially impart its moldability and rigidity characteristics thereto. The composite foam-within-a-foam structure is advantageously employed, preferably in perforated form, as an orthopedic wrap which, upon heating, can be readily molded to an injured limb and thereafter allowed to crystallize and harden to form a smooth, rigid supportive and protective cast.

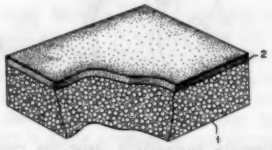
3,728,207
NON-WOVEN FABRIC
Wilhelm Heling, Benshein-Auerback, Germany, assignor to Carl Freudenberg, Postfach, Germany
No Drawing. Filed Nov. 12, 1970, Ser. No. 89,043
Claims priority, application Germany, Dec. 12, 1969, P 19 62 331.5
Int. Cl. B32b *5/14*
U.S. Cl. 161—151 **2 Claims**

A non-woven fabric comprising a fibrous mat bonded with collagen, the concentration of collagen decreasing from the surface inwardly. In this way, the high-collagen surface can be applied against wounds, with which it is chemically compatible. By coating the low-collagen surface with plastic such as polyvinylidene chloride and forming a tube with the high-collagen surface inside, the tube will conform closely to sausage material filling even if the latter shrinks, so as to maintain a pleasing appearance; the plastic exterior, however, keeps the product impervious to water vapor and air.

3,728,208
OIL ABSORBENT FOAMED SILICATE FOR OIL POLLUTION CONTROL
J. Mark C. Whittington, Hedgesville, W. Va., and John E. Meyer and Glenn D. Tingle, Hagerstown, Md., assignors to GAF Corporation, New York, N.Y.
No Drawing. Filed Feb. 9, 1971, Ser. No. 114,076
Int. Cl. B32b *3/26, 5/18, 17/00*
U.S. Cl. 161—159 **19 Claims**

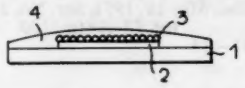
A porous alkali metal silicate foam having oleophilic-hydrophobic properties is provided for use in oil spill control and removal. The silicate foam is preferably formed from a blend comprising solid and liquid alkali metal silicates and an oil absorption-water repellent agent. The blend is pelletized, heated in an oven to expand the material into foam particles, and then shredded, graded and retreated with an oleophilic-hydrophobic agent to coat the internal and external surfaces and thereby further enhance the oil-absorption characteristics.

3,728,209
UNINFLAMMABLE STRUCTURAL MATERIALS
Suezo Sugaike and Masayuki Watanabe, Tokyo, and Shouzou Tanabe, Kanagawa, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed July 14, 1971, Ser. No. 162,594
Claims priority, application Japan, July 24, 1970, 45/64,358
Int. Cl. B32b *5/18*
U.S. Cl. 161—160 **3 Claims**



Uninflammable structural materials consisting of a board member prepared from aluminum nitride, phosphoric acid and light inorganic material and a foamed member made of aluminum nitride, phosphoric acid and inorganic foaming material and integrally bonded with said board member.

3,728,210
DRY TRANSFER
Jean Gustave Jules Piron, 360 D, Boulevard Emile Bockstael, Brussels, Belgium
Filed May 22, 1970, Ser. No. 39,752
Claims priority, application Great Britain, June 27, 1969, 32,716/69
Int. Cl. B44c *1/16*; B32b *7/06, 7/14*
U.S. Cl. 161—162 **20 Claims**



The invention relates to a dry transfer comprising a temporary support with printed ink signs and means for causing any selected ink sign to adhere to a receptor sheet under a sufficient pressure, so that said ink sign remains adhered to said receptor sheet when the temporary support is peeled away. Said means consist in layer of microcapsules retained on the free surface of each ink sign and containing a core material which will cause adhesion of ink sign to receptor sheet upon bursting of the microcapsules by liberating either a material reactivating a reactivatable adhesive applied on the ink sign, or a material which renders the receptor sheet temporarily tacky, or an adhesive material.

3,728,211
REINFORCED COMPOSITE
Claire G. Ball, Wheeling, Ill., and Arthur C. Grimm, Bellevue Borough, and Thomas Melville, Unity Township, Westmoreland County, Pa., assignors to United States Steel Corporation
Application Apr. 16, 1970, Ser. No. 29,211, now Patent No. 3,650,785, which is a continuation-in-part of abandoned application Ser. No. 663,315, Aug. 25, 1967. Divided and this application Aug. 30, 1971, Ser. No. 176,159
Int. Cl. B32b *5/16*; D04h *1/00*
U.S. Cl. 161—170 **2 Claims**

A reinforced composite of a castable matrix having discontinuous reinforcing filaments randomly distributed within the martix which reinforce the matrix and which are bonded to the matrix chemically and/or mechanically. The filaments have a non-round cross sectiontal configuration with width and thickness dimensions and with a width-to-thickness ratio of not greater than about five. For maximum reinforcing strength, the filaments should have an ultimate tensile strength at least equal to the average tensile stress developed in the filament at bond failure. The characteristics of the filaments are such as to permit dry admixing with the castable matrix material. A method of making the reinforced composite and apparatus for and a method of coating the filaments are disclosed.

3,728,212
HOT MELT ADHESIVE OF POLY(TETRAMETHYLENE)TEREPHTHALATE AND POLYSTYRENE OR POLYSTYRENE COPOLYMERS
John R. Caldwell and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 11,033, Feb. 12, 1970, and Ser. No. 11,890, Feb. 16, 1970, which is a continuation-in-part of application Ser. No. 671,940, Oct. 2, 1967, now abandoned. This application Mar. 23, 1971, Ser. No. 127,333
Int. Cl. B32b *9/04*; C08g *39/10*
U.S. Cl. 161—182 **10 Claims**

Improved hot melt adhesives comprising a poly(tetramethylene terephthalate) polyester having an inherent

viscosity of at least about 0.8, blended with a vinyl polymer selected from polystyrene and polystyrene copolymers and articles secured therewith.

3,728,213

ANTIBIOTIC PAPER

Charles Frank Hinz, East Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 773,954, Nov. 6, 1968, abandoned, and a continuation-in-part of Ser. No. 42,479, June 1, 1970, abandoned. This application Aug. 18, 1971, Ser. No. 172,880

Int. Cl. D21h *5/22, 3/12*

U.S. Cl. 162—161 **7 Claims**

Cellulose fibers possess strong antibiotic properties (including antiviral properties) when they have a uniform content of a small amount of a 2-(C_8–C_{18} substantially straight chain) pseudourea. The fibers remain antimicrobial when in addition they contain a normally water-soluble thermosetting wet strength resin in thermoset state. Antibiotic bandages, diapers, bed sheets, boxes, surgeons' gowns, etc. can be prepared from paper composed of these fibers.

3,728,214

POLYAMINE-ACRYLAMIDE-POLYALDEHYDE RESINS HAVING UTILITY AS WET AND DRY STRENGTHENING AGENTS IN PAPERMAKING

Herbert H. Espy, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,863

Int. Cl. D21h *3/58;* **C08g** *9/02*

U.S. Cl. 162—167 **17 Claims**

Disclosed is a novel polyamine-acrylamide-polyaldehyde resin useful in the papermaking art to enhance the wet and dry strength of paper.

3,728,215

AMINOPALYAMIDE—ACRYLAMIDE—POLYALDEHYDE RESINS EMPLOYING AN ALPHA, BETA-UNSATURATED MONOBASIC CARBOXYLIC ACID OR ESTER TO MAKE THE AMINOPOLYAMIDE AND THEIR UTILITY AS WET AND DRY STRENGTHENING AGENTS IN PAPERMAKING

Herbert H. Espy, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed March 12, 1971, Ser. No. 123,864

Int. Cl. D21h *3/58;* **C08g** *9/02*

U.S. Cl. 162—167 **18 Claims**

Disclosed are novel aminopolyamide—acrylamide—polyaldehyde resins useful in the paper making art to enhance the wet and dry strength of paper. The aminopolyamide results from the condensation of a polyalkylene polyamine with an alpha, beta-unsaturated monobasic carboxylic acid or ester.

3,728,216

DIALLYLAMINE-AMIDE-POLYALDEHYDE RESINS HAVING UTILITY AS WET AND DRY STRENGTHENING AGENTS IN PAPERMAKING

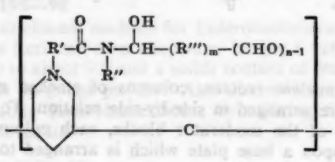
Ralph A. Bankert, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,865

Int. Cl. D21h *3/58;* **C08g** *9/02*

U.S. Cl. 162—167 **15 Claims**

Disclosed are resins prepared from a diallylamine, an amide and a polyaldehyde. The resins have the following repeating units



where R′ is methylene or ethylene, R″ is hydrogen or a lower alkyl radical, R‴ is a saturated or unsaturated aliphatic, cycloaliphatic or aromatic radical, m is 0 or 1 and n is at least 2. Also disclosed is the process for the preparation of the resin and its use to impart dry and wet strength to paper.

3,728,217

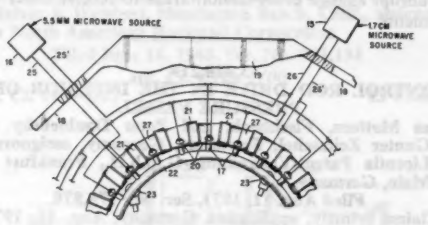
BUMPY TORUS PLASMA CONFINEMENT DEVICE

Raphael A. Dandl, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed June 5, 1972, Ser. No. 259,984

Int. Cl. G21b *1/00*

U.S. Cl. 176—3 **10 Claims**



A toroidal thermonuclear plasma containment device is provided in which full toroidal plasma confinement is made possible by joining a set of individual segments containing steady-state, high-β, hot electron plasmas, sustained and heated by microwave power, to stabilize a less energetic toroidally confined plasma component. Each segment comprises a high-β relativistic electron plasma ring that is formed between two canted mirror coils with resonant and upper off-resonant microwave heating when the two mirror coils are pivoted about parallel axes (normal to the mirror axis) by equal but opposite angles to produce the nonaxisymmetric plasma ring. Thus, a bumpy torus is provided which is made magnetohydrodynamically stable by maintaining in each bump of the torus, and outside the toroidal plasma, a high pressure, relativistic electron plasma ring which is itself stabilized by cold plasma line tying.

3,728,218

CONTROL RODS FOR NUCLEAR REACTORS

Heinrich Gnutzmann, Mannheim, and Holger Kassler, Hannover, Germany, assignors to Brown Boveri/Krupp Reaktorbau G.m.b.H.

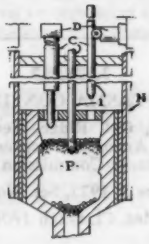
Continuation-in-part of application Ser. No. 765,955, Oct. 8, 1968. This application May 24, 1971, Ser. No. 146,288

Int. Cl. G21c *7/10*

U.S. Cl. 176—36 R **21 Claims**

A control rod for use in combination with a nuclear reactor system which comprises a pebble-bed reactor containing a loose pile of ball-shaped fuel elements into which the control rod is insertable, said rod being hollow and having defined in its hollow interior one or more channels for receiving fuel elements. The fuel elements are adapted to enter the channels via at least one entry opening at one end of the control rod. The control rod may be rela-

tively smoothly tapered or have abrupt changes of cross-section with additional entry openings in both the tapered



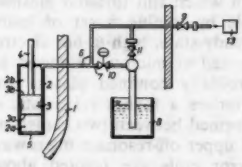
or abrupt change cross-section areas to receive other fuel elements.

3,728,219

CONTROL ROD DRIVE IN THE INTERIOR OF A PRESSURE VESSEL

Jean Mattern, Fischbach, and Peter Daublebsky and Gunter Zeltzschel, Frankfurt, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Aug. 11, 1971, Ser. No. 170,878
Claims priority, application Germany, Aug. 11, 1970, P 20 39 845.2
Int. Cl. G21c 7/16
U.S. Cl. 176—36 R 3 Claims



In an operating system for a hydraulic or pneumatic control rod drive of a nuclear reactor including a lifting cylinder within the pressure vessel of the reactor and a lifting piston within the lifting cylinder and connected to the control rod which extends into the reactor core, the system including a line leading to an external pressure source and the lifting cylinder being in direct communication with the pressure medium in the pressure vessel on the side of the lifting piston facing the reactor core for urging the control rods into the core and a counter pressure produced within the lifting cylinder by the pressure source communicating therewith through the line for removing the control rods from the reactor core.

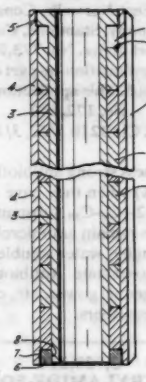
3,728,220

NUCLEAR REACTOR FUEL PINS

Kenneth Prince, Bowdon, and Alan Charles Anthony Saunders, Hale, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed June 1, 1971, Ser. No. 148,319
Claims priority, application Great Britain, June 17, 1970, 29,450/70
Int. Cl. G21c 3/18
U.S. Cl. 176—58 3 Claims

A nuclear reactor fuel pin comprises a stack of annular fuel compacts sheathed by co-axial graphite tubes. The tubes are rigidly secured at one end and the outer tube has an inwardly extending flange which slidingly embraces the inner tube. The stack of fuel compacts abuts



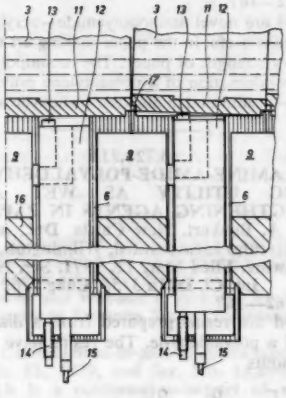
the flange so that under irradiation which causes radial shrinkage and longitudinal growth of the compacts, both tubes are strained.

3,728,221

APPARATUS FOR FACILITATING REMOVAL OF MODERATOR BLOCKS FROM A NUCLEAR REACTOR BY TILTING THE BLOCK SUPPORTING BASE PLATES

Josef Waldis, Untersiggenthal, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed May 11, 1971, Ser. No. 142,289
Claims priority, application Switzerland, May 29, 1970, 8,048/70
Int. Cl. G21c 5/02, 5/06, 5/10
U.S. Cl. 176—84 7 Claims



In a nuclear reactor, columns of stacked moderator blocks are arranged in side-by-side relation. To facilitate removal of the moderator blocks, each column is supported upon a base plate which is arranged to be tilted

from its normal vertical position by means of a piston arrangement so as to separate the blocks in one column from those in an adjacent column.

3,728,222

PROCESS FOR PREPARING NICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHATE

Fumio Kato, Akira Yamaguchi, Toshio Tatano, and Yoshiaki Shimizu, Shizuoka-ken, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,478
Claims priority, application Japan, Oct. 27, 1970, 45/93,910
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 N **14 Claims**

Nicotinamide adenine dinucleotide phosphate is prepared by fermentation of microorganisms selected from the group of *Brevibacterium ammoniagenes, Arthrobacter ureafaciens, Arthrobacter citreus, Corynebacterium rathayi, Micrococcus varians, Serratia marcescens, Candida utilis, Saccharomyces cerevisiae* and *Streptomyces aureus.* Fermentation takes place in a culture medium containing at least one of the following: nicotinic acid, nicotinic acid amide, nicotinic acid mononucleotide, nicotinamide mononucleotide, nicotinic acid riboside, nicotinamide riboside, and nicotinic acid adenine dinucleotide; together with adenine derivatives.

3,728,223

PRODUCTION OF HYALURONIDASE FROM A STRAIN OF STREPTOMYCES

Yasuyuki Kaneko, Takaichi Ohya, and Genichi Amano, Aichi Prefecture, and Hitoshi Oiwa, Saitama Prefecture, Japan, assignors to Amano Seiyaku Kabushiki Kaisha, Naka-ku, Nagoya, Japan

No Drawing. Continuation of abandoned application Ser. No. 784,460, Dec. 17, 1968. This application Oct. 8, 1971, Ser. No. 187,851
Int. Cl. C07g *7/028*
U.S. Cl. 195—62 **9 Claims**

A novel hyaluronidase is produced by cultivating a new strain of *Streptomyces hyalurolyticus.*

3,728,224

ENZYME PURIFICATION PROCESS

Gerald Baltzer Borglum, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 12, 1970, Ser. No. 89,092
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R **8 Claims**

An enzyme solution containing various impurities can be purified by mixing said solution with a quaternary ammonium compound to form a precipitate between the impurities and the added compound and then separating said precipitate from the so-purified solution. This process is especially useful to treat an enzyme solution that is subsequently to be concentrated in an ultrafiltration procedure.

3,728,225

PROCESS FOR INCUBATING SALMONELLA

Robert John Kuncic, Summit, Ill., assignor to CPC International Inc.

No Drawing. Filed May 28, 1970, Ser. No. 41,645
Int. Cl. C12k *1/06*
U.S. Cl. 195—96 **6 Claims**

A preenrichment medium for Enterobacteriaceae which comprises sterilized corn steepwater having a pH of from about 6.0 to about 9.0 and a solids content of from about 5 to about 60 grams per liter. Also disclosed in a method of incubating Enterobacteriaceae by utilizing the aforementioned media.

3,728,226

BLOOD SERUM ANALYTICAL CONTROL STANDARD

Allan L. Louderback, Temple City, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Filed June 1, 1970, Ser. No. 42,597
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 R **1 Claim**

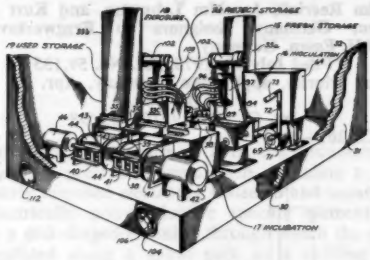
A control standard for the analytical determination of multiple blood serum components consisting of a mixture of at least three of said blood serum components having their respective concentrations indiscriminately predetermined by random selection from the range of lowest to highest levels of each said component established by instrumentation parameters and clinical significance.

3,728,227

MICROORGANISM CULTURE APPARATUS

Edward E. Elson, Sherman Oaks, Don L. Isenberg, Irvine, Edwin R. Schnauss, Los Angeles, Edward H. C. Sie, Pacific Palisades, Earl V. Wagoner, Jr., San Pedro, and Melvin S. Weisbart, Huntington Beach, Calif., assignors to North American Rockwell Corporation

Filed June 18, 1968, Ser. No. 741,151
Int. Cl. C12k *1/00*
U.S. Cl. 195—127 **13 Claims**



Apparatus is described for storage, inoculation, incubation, and utilization of microorganisms, particularly those exhibiting luminescence. A plurality of stations are provided for performing these functions and a transport mechanism transports special culture vessels to successive ones of the stations during operation of the apparatus. Multiple vessels of sterile nutrient medium are stored and individually inoculated by an automatic inoculating mechanism. The resultant cultures of microorganisms are incubated in a controlled environment for optimum luminosity and then exposed to an environment which may contain toxic materials which will affect the luminous light output. An automatic warning system may signal presence of a toxic material. After use the cultures are stored within the apparatus for disposal. All of these operations are performed in a unified apparatus capable of operation for prolonged periods without maintenance.

3,728,228

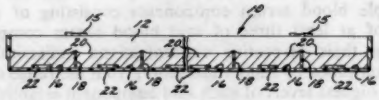
DEVICE FOR INDICATION OF BACTERIAL SENSITIVITY TO ANTIBIOTICS

Lawrence P. Duranty, Rolling Hills Estates, Calif., assignor to M.D. Laboratories, Inc., Carson, Calif.

Filed Oct. 12, 1971, Ser. No. 188,033
Int. Cl. C12k *1/04*
U.S. Cl. 195—127 **1 Claim**

A device for indication of bacterial sensitivity to antibiotics and including a tray divided into a plurality of compartments whch are each partially filled with a nutrient material for supporting bacterial growth. A different

antibiotic agent is embodied in and diffused through the nutrient material in each compartment. A cover is pivoted to the tray to protect the tray interior from environmental contamination. In one embodiment the antibiotic agents are introduced in liquid form in the nutrient material, while in another embodiment the antibiotic agents are used to impregnate paper discs which are placed in the bottom of the compartments prior to filling with



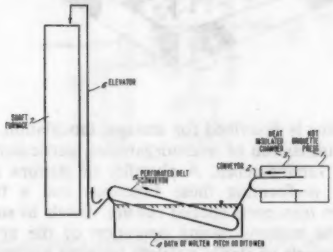
the nutrient material. The agents subsequently diffuse throughout the nutrient material and their capability for such diffusion is another measure of their effectiveness against microorganisms. The tray cover can be provided with appropriate indicia to identify the particular antibiotic agent in the various tray compartments. The tray, nutrient material, antibiotic agents and cover form an integral unit or package particularly adapted for use by non-laboratory personnel, such as in a physician's office.

3,728,229

PROCESS FOR THE MANUFACTURE OF ABRASION-RESISTANT SHAPED COKE

Wilhelm Reerink, Joachim Lehmann, and Kurt Kleisa, Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed July 29, 1970, Ser. No. 59,133
Claims priority, application Germany, Apr. 23, 1970, P 20 19 569.1
Int. Cl. C10b *45/02, 53/08*
U.S. Cl. 201—6 **7 Claims**



Briquettes made from a coking coal with or without the addition of coke are immersed in a high temperature bath of pitch or the like. The briquettes are thereby coated and impregnated with the bath composition. The briquettes then follow the normal procedure of passage through a furnace at a temperature such that coking results. This procedure avoids the violent evolution of gas which can otherwise occur within the coking furnace and results in shaped coke of high resistance to abrasion.

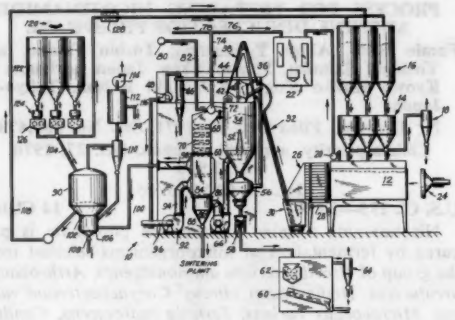
3,728,230

INDIRECTLY HEAT EXCHANGING PLURAL GAS STREAMS FOR DRY QUENCHING HOT COKE AND DRYING COAL

Roland Kemmetmueller, Pittsburgh, Pa., assignor to American Wagner-Biro Company, Inc., Pittsburgh, Pa.

Filed Feb. 7, 1972, Ser. No. 224,154
Int. Cl. C10b *39/02*
U.S. Cl. 201—39 **4 Claims**

A coke plant and method for operating the same according to which the coke is cooled by dry-quenching and the coal is dried, prior to being charged in a coke oven, with heat extracted during dry-quenching of the coke. The coke plant and



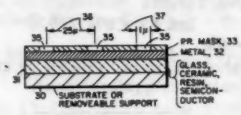
method, in addition to carrying out the latter operations, reduce pollution of the atmosphere by releasing only cleaned and desulfurized gas to the outer atmosphere.

3,728,231

METHOD OF FORMING AN ULTRAFINE APERTURE MASK

Harold Samuel Gurev, Paradise Valley, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 8, 1971, Ser. No. 132,495
Int. Cl. C23b *5/48*
U.S. Cl. 204—15 **13 Claims**



There is disclosed an ultrafine aperture metal mask and a method for forming the mask involving an electroplating step. Apertures are first formed by conventional techniques through a metal layer which is deposited on a glass, resin, ceramic or semiconductor type substrate. Thereafter, the patterned metal film is immersed in an electroplating bath which electroplates a metal which adheres to the metal film so as to close down the already formed apertures in the metal film. The substrate is nonconductive such that the metal from the electroplating bath does not deposit on the substrate. In this manner pinholes on the order of 0.1 to 0.2 micron can be formed from apertures having mean diameters of between 1 and 25 microns initially. The ultrafine aperture metal mask thus formed may be used in itself as a gas filter, as a diffusion mask and as a radiation mask for X-ray, gamma-ray or light. As a light mask it is most generally used for making other pinholed structures by photolithographic process. In addition the metal mask may be used directly for making other pinhole structures by etching through the mask with etchants which do not attack the mask itself. In one embodiment the metal mask is used either directly or indirectly to pattern a glassy substrate so that the glassy substrate then forms a diffusion barrier, a metallization mask, a filter or a screen.

3,728,232

METHOD OF PLATING USING A PROTECTIVE COATING ON AN ELECTROPLATING WORK SUPPORT

Koh Morita and Itsuo Shimizu, Yokohama, Japan, assignors to Chisso Corporation

No Drawing. Continuation of application Ser. No. 880,993, Nov. 28, 1969. This application Dec. 10, 1971, Ser. No. 206,883

Int. Cl. C23b 5/60, 5/70

U.S. Cl. 204—30 6 Claims

Protection of plating jigs, baskets, plating racks, conveyor hooks and the like from chemical action in a plating operation is accomplished by coating the aforementioned apparatus with a composition comprising (1) a polymeric material insoluble in both water and plating solutions and (2) antimony oxide.

This is a continuation of application S.N. 880,993, now abandoned, filed Nov. 28, 1969.

3,728,233

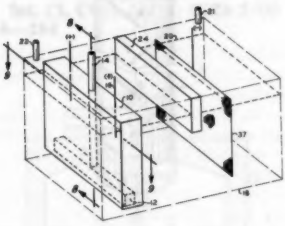
POROUS ELECTRODE HAVING OPEN FEED CAVITY

Benedict H. Ashe, Jr., and Homer M. Fox, Bartlesville, Okla., assignors to Phillips Petroleum Company

Continuation of application Ser. No. 75,293, Sept. 24, 1970, which is a continuation of appplication Ser. No. 739,507, June 24, 1968. This application Feb. 14, 1972, Ser. No. 226,039

Int. Cl. B01k 3/00; C07b 29/06

U.S. Cl. 204—59 R 17 Claims



In an electrochemical process, the reaction takes place within the confines of a porous electrode element. The bottom of this electrode element has a cavity open to the bulk of the electrolyte. The gaseous or vaporous feed materials are introduced into this cavity, and are converted during their upward passage through the electrode without contact with the bulk of the electrolyte.

3,728,234

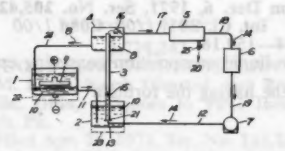
METHOD OF AND APPARATUS FOR CIRCULATING LIQUID METALS IN FUSED SALT ELECTROLYSIS

Hidetami Sakai, Funabashi, and Muneyoshi Arita, Sakura, Japan, assignors to Daiki Engineering Co., Ltd., Tokyo, Japan

Original application Mar. 10, 1970, Ser. No. 18,103, now Patent No. 3,642,603. Divided and this application Nov. 17, 1971, Ser. No. 199,450

Int. Cl. C22d 3/06, 1/06, 3/02

U.S. Cl. 204—68 3 Claims



A method of and an apparatus for circulating a liquid metal in fused salt electrolysis comprising passing the fused alloy of the cathode liquid metal and the electrolytically liberated metal both coming out of the cell and the liquid metal for controlling the temperature of the cell through a lift pipe by making a mixture of an inert gas and the liquid metals by the jetting force of the gas, said mixture being small in specific gravity, lifting said liquid metals into a head tank positioned at a level high enough for recirculating the liquid metals into the electrolytic cell by gravity, separating the liquid metals from the inert gas in said head tank, recirculating the liquid metal necessary for electrolysis into the cell, condensing and separating the electrolytically liberated metal contained in the inert gas from the gas, and returning the inert gas into the lift pipe for further use by circulation.

3,728,235

ELECTROLYTIC METHOD FOR RECOVERING METAL FROM SOLUTION

Austin C. Cooley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original application Feb. 12, 1969, Ser. No. 798,624. Divided and this application May 19, 1971, Ser. No. 144,968

Int. Cl. C22d 1/12

U.S. Cl. 204—109 6 Claims

Method for recovering a metal from a solution in which the metal is present in ionic form, including a pair of oppositely disposed electrodes sealed to and separated by an electrically non-conductive spacing element which forms a disk-shaped chamber through which the solution is circulated along a spiral path as a swirling stream while impressing an electric potential across the electrodes to cause the metal ions in the solution to plate out on the electrode surface of lower potential. The swirling streams desirably are passed through two adjoining chambers having a common wall which serves as a cathode, and having two anodes spaced on opposite sides of the cathode. The method is particularly well adapted to recovering silver from fixing solutions employed in photographic processing and permits such recovery to be effected at exceptionally high current densities.

3,728,236

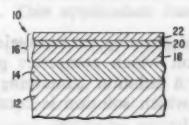
METHOD OF MAKING SEMICONDUCTOR DEVICES MOUNTED ON A HEAT SINK

Kenneth Perry Weller, Hightstown, and Cheng Paul Wen, Mercer, N.J., assignors to RCA Corporation

Filed Aug. 5, 1971, Ser. No. 169,438

Int. Cl. C23b 3/00

U.S. Cl. 204—129.1 10 Claims



A region of a semiconductor material which is of a conductivity type or types required by the semiconductor

devices being formed is provided on a low resistivity P type semiconductor substrate with a thin barrier region of high resistivity semiconductor material being between the substrate and the semiconductor device region. A metal heat sink body is provided on the semiconductor device region. The substrate is then removed by electrolytically etching the substrate. The barrier region is removed by chemically etching to expose a surface of the semiconductor device region. Contact pads are formed on the surface of the semiconductor device region and the semiconductor device region-metal body composite is divided into individual semiconductor devices each mounted on a heat sink.

3,729,237

METHOD OF MANUFACTURING ALUMINUM ELECTRODE FOIL FOR ELECTROLYTIC CAPACITORS

Martinus Gerard Jens Heijenbrok and Arend Van Herwijnen, Zwolle, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 56,051, June 24, 1970, which is a continuation of application Ser. No. 670,789, Sept. 26, 1967, both now abandoned. This application July 16, 1971, Ser. No. 163,471

Claims priority, application Netherlands, Sept. 27, 1966, 6613586

Int. Cl. C23b *1/00, 3/02*

U.S. Cl. 204—129.75 **4 Claims**

Improvement in etching of aluminum foil for electrolytic capacitors wherein ammonium persulfate, tartaric acid or a soluble tartrate is added to the etching solution.

3,728,238

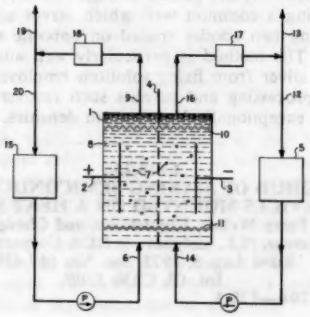
DECREASING HEXAVALENT CHROMIUM CONTENT OF LIQUIDS BY AN ELECTROCHEMICAL TECHNIQUE

Michael Tarjanyi, North Tonawanda, and Murray P. Strier, Amherst, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 14, 1971, Ser. No. 133,924

Int. Cl. B01k *3/00;* **C02c** *5/12*

U.S. Cl. 204—149 **14 Claims**



A method for decreasing the hexavalent chromium content of a solution which comprises passing an electric current through a solution containing hexavalent chromium material, which solution is contained as the electrolyte in a cell, said cell having at least one positive and one negative electrode, between which the current is passed, and wherein the electrolyte also contains a bed of particles, distributed therein, such that the porosity of the bed is from about 40 to 80%, porosity being defined as

$$\left(1-\frac{\text{volume of particles}}{\text{volume of cell wherein the particles are distributed}}\right)\times 100$$

The electrolysis of the electrolyte is continued until the desired reduction in the hexavalent chromium content thereof is obtained.

3,728,239

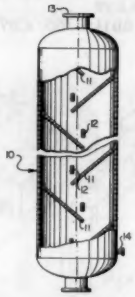
CATALYST STRIPPING IN A BAFFLED VERTICAL VESSEL

Gerald W. G. McDonald, Summit, N.J., assignor to Commonwealth Oil Refining Company, Inc., New York, N.Y.

Filed July 1, 1970, Ser. No. 51,491

Int. Cl. B01j *11/02;* **C10g** *13/14*

U.S. Cl. 208—150 **2 Claims**



Improved gas-solid contact is achieved when treating finely divided solids with a gas in a vertical cylindrical vessel provided with a plurality of vertically-spaced, downwardly sloping baffles and with a substantially vertical impingement plate mounted directly above a downwardly sloping baffle. The apparatus is particularly suitable for stripping residual hydrocarbons from catalyst used in fluid catalytic cracking processes.

3,728,240

CURABLE LIQUID POLYENE-POLYTHIOL COMPOSITIONS CONTAINING ACRYLIC ACID COPOLYMERS

Edwin W. Lard, Bowie, Md., assignor to W. R. Grace & Co.

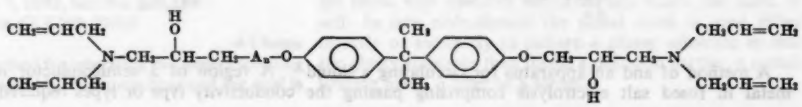
No Drawing. Application Nov. 2, 1970, Ser. No. 86,355, which is a continuation-in-part of abandoned application Ser. No. 74,185, Sept. 21, 1970. Divided and this application Dec. 6, 1971, Ser. No. 205,427

Int. Cl. B01j *1/00;* **C08d** *1/00*

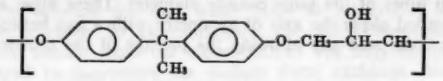
U.S. Cl. 204—159.16 **9 Claims**

A curable liquid composition consisting essentially of:

(a) a polyene having the formula



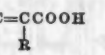
where A is



and n is essentially 0 or greater (e.g., 0–20);

(b) a polythiol, the equivalent ratio of polyene to polythiol being about 1:0.5–1.5; and

(c) a member selected from a group consisting of a monomeric acid having the formula



where R is H, CH_3, or C_2H_5 or a homopolymer of copolymer of such monomeric acid having an average molecular weight of about 140–1000, the group member constituting about 2–10% by weight of the composition.

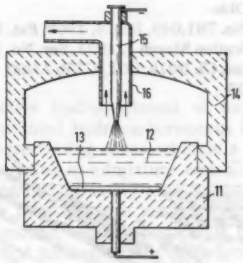
The above composition can contain an effective amount of a photocuring rate accelerator.

3,728,241

ELECTROLYSIS OF FUSED MATERIAL

Thomas Richard Shelley and James Anthony Charles, Cambridge, England, assignors to National Research Development Corporation, London, England

Filed Apr. 15, 1970, Ser. No. 28,644
Claims priority, application Great Britain, Apr. 17, 1969, 19,751/69
Int. Cl. C01b *13/14*; C22b *5/00*
U.S. Cl. 204—164 **11 Claims**



According to the present invention a method of separating a required component from an electrolyte bath containing a molten material, e.g. a slag or ore which includes a component which is volatile or is convertible into a volatile compound by electrolysis, electrolysing the melt by passing a current between a pair of electrodes along a path which includes an arc struck between one electrode and the melt, and drawing off the required volatile component or volatile compound thereof given off from the melt during electrolysis, the composition of the melt being such that a major part of the required component is a product of electrolysis released at said arc.

The method is of particular interest for recovery of tin.

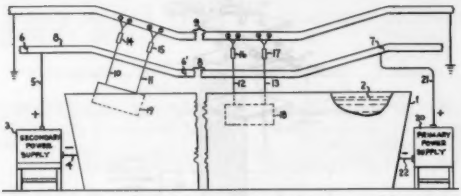
3,728,242

CONTINUOUS ELECTRODEPOSITION PROCESS

Frederick M. Loop, North Olmsted, and Boyd J. Smith, Brecksville, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 28, 1971, Ser. No. 138,260
Int. Cl. B01k *5/02*; C23b *13/00*
U.S. Cl. 204—181 **9 Claims**

In a continuous electrodeposition process where the article enters the electrodeposition bath in a power-off configuration, it has been found that surface irregularities occur on an article when that article is introduced power-off into the electrodepositable composition while the preceding article is still being coated and is in a power-on condition. This problem is solved by applying a small voltage to the article being introduced until such time as the coating voltage is applied.

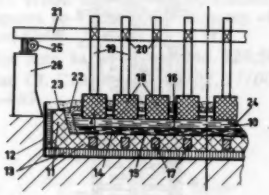


3,728,243

ELECTROLYTIC CELL FOR THE PRODUCTION OF ALUMINUM

Wolfgang Schmidt-Hatting, Chippis, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 25, 1971, Ser. No. 174,892
Claims priority, application Switzerland, Sept. 1, 1970, 13,101/70
Int. Cl. C22d *3/02, 3/12*
U.S. Cl. 204—243 R **2 Claims**



Electrolytic cell for the production of aluminum having prescribed maximum horizontal distance between outer lower edges of the anodes and adjacent wall surfaces of the pot lining, pot lining with specified thermal isolating power, cathode bars insulated beneath the side wall of the lining and specific ratio of iron cross section to carbon cross section through the bottom of the lining, in order to reduce the horizontal components of the electric current in the cell.

3,728,244

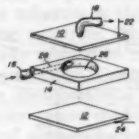
HIGH CURRENT DENSITY ELECTROLYTIC CELL

Austin C. Cooley, 1669 Lake Ave., Rochester, N.Y. 14650

Continuation of abandoned application Ser. No. 798,624, Feb. 12, 1969. This application June 21, 1971, Ser. No. 155,278
Int. Cl. B01r *3/00*; C23b *5/68*
U.S. Cl. 204—269 **12 Claims**

Apparatus for recovering a metal from a solution in which the metal is present in ionic form, including a pair of oppositely disposed electrodes sealed to and separated by an electrically non-conductive spacing element which forms a disk-shaped chamber through which the solution is circulated and means for impressing an electric potential across the electrodes to cause the metal ions in the solution to plate out on the electrode surface of lower

potential. The apparatus is particularly well adapted to recovering silver from fixing solutions employed in



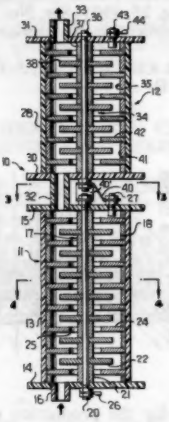
photographic processing and permits such recovery to be effected at exceptionally high current densities.

3,728,245

APPARATUS FOR TREATING SEWAGE

William R. Preis, River Edge, and William Cole, Oakland, N.J., assignors to Cole Resedevel Corp., Fairlawn, N.J.

Filed Jan. 13, 1971, Ser. No. 106,162
Int. Cl. C02b *1/82;* **C02c** *5/12*
U.S. Cl. 204—275 **11 Claims**



This disclosure relates to an apparatus and method for treating domestic and/or industrial waste water to render the same into a condition for either further reuse in industrial processing or for outflow into natural waters. The treatment utilizes the principles of electrolysis to ionize the water utilizing the sodium of sodium chloride to form sodium hydroxide and the chloride as a bleaching agent. The treatment takes place in a simple two stage cell.

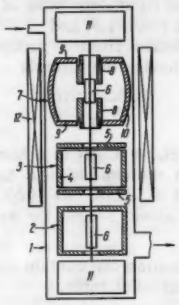
3,728,246

DEVICE FOR APPLYING THIN FILMS TO ARTICLES

Eduard Mikhailovich Barkhudarov, ulitsa Chonkadze 10a, kv. 27; Nikolai Arsenovich Kervalishvili, prospekt Chavchavadze 19, kv. 16; and Vladimir Parmenovich Kortkhondzhia, ulitsa Dzerzhinskogo 4, all of Tbilisi, U.S.S.R.

Filed Aug. 25, 1971, Ser. No. 174,765
Claims priority, application U.S.S.R., Jan. 22, 1970, 1,395,686
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **2 Claims**

The cathode sputtered by ion bombardment and the anode have a common axis of symmetry in the vacuumized gas-discharge chamber. The anode is formed by two tubes of the same outside diameter. These tubes are installed along the axis of symmetry with a gap between the ends, said gap allowing the passage of the sputtered



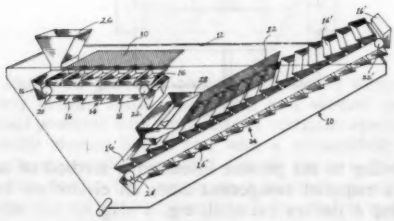
material of the cathode onto the article installed in the gap. The gas-discharge chamber is located in a magnetic field whose lines of force coincide in direction with the axis of symmetry. This magnetic field is intended to produce a low-pressure discharge in the chamber.

3,728,247

APPARATUS FOR COATING CONDUCTIVE ARTICLES

Eugene E. Haney, Middletown, Ohio, assignor to Armco Steel, Middletown, Ohio

Division of Ser. No. 781,049, Dec. 4, 1968, Pat. No. 3,316,392.
This application March 1, 1971, Ser. No. 119,718
Int. Cl. B01k *5/02;* **C23b** *13/00*
U.S. Cl. 204—300 **3 Claims**



Apparatus for electrical deposition of a coating from an aqueous solution simultaneously on a plurality of conductive articles including a conductive container within a tank holding the aqueous solution for receiving a plurality of articles to be coated, and means for shifting the position of the articles relative to each other at predetermined time intervals.

3,728,248

APPARATUS FOR USE IN AN IMPROVED ELECTRO-DIALYSIS PROCESS

Roberto Passino, Rome, and Gianfranco Boari, Bari, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

No Drawing. Original application Nov. 18, 1968, Ser. No. 776,821, now Patent No. 3,637,480. Divided and this application Jan. 17, 1972, Ser. No. 218,454
Int. Cl. B01d *13/02;* **C02b** *1/82*
U.S. Cl. 204—301 **4 Claims**

A process and apparatus for the desalination of salt water employing separate sodium and hydrogen form

cation exchange resins to soften, to dealkalize and to partially deionize the said water prior to substantial demineralization by electrodialysis. The salt concentrated waste stream from the electrodialysis cell may be employed to regenerate the sodium form exchange resin that becomes exhausted during the softening step.

3,728,249

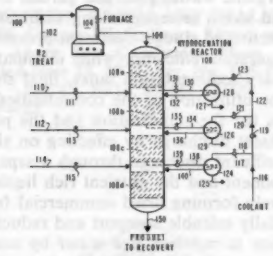
SELECTIVE HYDROTREATING OF DIFFERENT HYDROCARBONACEOUS FEEDSTOCKS IN TEMPERATURE REGULATED HYDROTREATING ZONES

Fernando J. Antezana, New York, N.Y., and Jack M. Hochman, Boonton, and Harold N. Weinberg, Livingston, N.J., assignors to Esso Research and Engineering Company

Filed Feb. 5, 1971, Ser. No. 112,995

Int. Cl. C10g *13/00, 23/00*

U.S. Cl. 208—57 **10 Claims**



In the selective hydrotreatment of any plurality of differently constituted hydrocarbonaceous feedstocks in a plurality of hydrotreating zones, wherein a first such feedstock is hydrotreated in admixture with an excess of hydrogen in a first hydrotreating zone to obtain a first zone effluent that is then fed to a second hydrotreating zone into which a second hydrocarbonaceous feedstock is introduced, the first zone effluent is cooled to a temperature within a predetermined range prior to hydrotreatment in the second zone, the second feedstock constituting a partial but not the sole coolant for the cooling. Supplemental cooling is provided directly by contact with injected water or indirectly by interstage cooling exteriorly of the hydrotreating zones.

3,728,250

INTEGRAL HYDROFINING-HYDROGENATION PROCESS

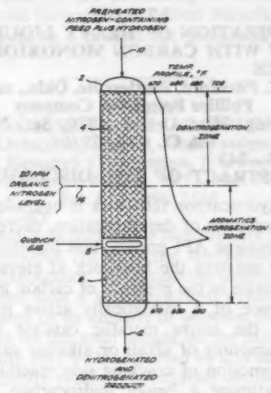
Robert H. Hass and Nicholas L. Kay, Fullerton, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 679,861, Nov. 1, 1967. This application July 2, 1970, Ser. No. 51,765

Int. Cl. C10g *23/00*

U.S. Cl. 208—89 **12 Claims**

Aromatic mineral oil feedstock boiling below about 700° F. and also containing substantial amounts of organic nitrogen are first hydrofined over a catalyst comprising nickel plus molybdenum and/or tungsten to reduce the organic nitrogen content to below about 20 parts per million, and total effluent therefrom is then hydrogenated over the same type of catalyst at pressures above about 1,000 p.s.i.g. to effect a substantial saturation of aromatic hydrocarbons. The most significant novel feature of the invention lies in effecting hydrogenation of mono-aromatic hydrocarbons with the specified



catalysts in the presence of both ammonia and hydrogen sulfide.

3,728,251

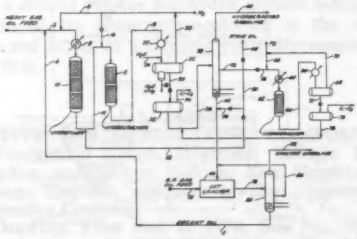
GASOLINE MANUFACTURE BY HYDROREFINING, HYDROCRACKING AND CATALYTIC CRACKING OF HEAVY FEEDSTOCK

Arnold E. Kelley and Cloyd P. Reeg, Orange, and Frederick C. Wood and George D. Cheadle, Fullerton, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 11, 1968, Ser. No. 720,508

Int. Cl. C10g *23/02, 13/02, 11/00*

U.S. Cl. 208—89 **6 Claims**



A mineral oil feedstock having an API gravity between −5° and 20°, less than 20 wt. percent boiling below 600° F., at least 20 wt. percent boiling above 800° F. and containing condensed polyaromatic, sulfur and nitrogen compounds is initially subjected to catalytic hydrofining followed by hydrocracking at high pressures with a Group VI–B and/or Group VIII metal promoted, crystalline zeolite catalyst. The hydrocracking conditions are chosen to achieve 2–20% increase in hydrogen content of the 600° F.+ fraction and not more than 20 wt. percent conversion of the 800° F.+ fraction to lower-boiling hydrocarbons. Gasoline is recovered as product while subjecting the hydrocracked product boiling above 400° F. to catalytic cracking to recover a cracked gasoline product, a cycle oil and heavy bottoms, said bottoms being recycled to the hydrofining reaction.

ERRATUM

For Class 208—150 see:
Patent No. 3,728,239

3,728,252
DESULFURIZATION OF HEAVY LIQUID HYDROCARBON WITH CARBON MONOXIDE AT HIGH PRESSURE

Armin C. Pitchford, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Oct. 1, 1970, Ser. No. 77,360
Int. Cl. C10g *29/04*
U.S. Cl. 208—243 9 Claims

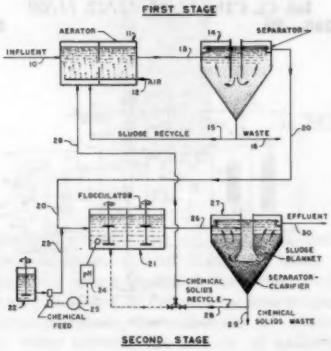
ABSTRACT OF THE DISCLOSURE

A heavy hydrocarbon feedstock is upgraded by at least one of the processes of desulfurization, decreasing carbon residues, increasing API gravity, and liquefaction of solid feedstock by reacting the feedstock at elevated temperature and pressure in the presence of carbon monoxide and in the presence of a catalytically active metal. In one embodiment the active metallic catalyst is associated with minor amounts of alkali or alkaline earth metals to minimize promotion of cracking side reactions. In a preferred embodiment a heavy hydrocarbon feedstock is upgraded in the presence of the catalyst system formed from a barium salt which has been deposited on cobalt molybdate dispersed on an alumina support.

3,728,253
ACCELERATED BIOLOGICAL-CHEMICAL WASTEWATER TREATMENT

Warren J. Kaufman, El Cerrito, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed May 5, 1971, Ser. No. 140,381
Int. Cl. C02c *1/06*
U.S. Cl. 210—5 4 Claims

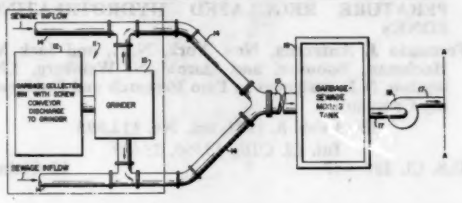


In a wastewater treatment plant employing an aerobic biological process as a first stage, followed by a chemical-flocculation stage, solids obtained in the latter stage are continuously recycled to the aerobic reactor of the first stage in amounts sufficient to maintain the content of inorganic suspended material therein at a level between 30 and 60 percent based on the weight of total suspended solids present in said reactor. The presence of the chemical solids permits the biological stage to remove degradable carbon with great efficiency, even at high applied volumetric loadings such as between about 300 to 600 pounds BOD per day per 1000 cubic feet of aeration tank capacity, and at high concentrations of active biological solids ranging from 3000 to 6000 mg./l., or more. Excellent removal of phosphates is achieved in the chemical-flocculation stage. A high degree of removal of organic nitrogen is also obtained.

3,728,254
METHOD AND APPARATUS FOR ECOLOGICAL RECYCLING OF WASTE PRODUCTS TO PRODUCE FERTILIZER AND GARDEN PLANT NUTRIENTS

Charles H. Carothers, 51 Irving Place, Red Bank, N.J. 07701

Filed Sept. 22, 1971, Ser. No. 182,584
Int. Cl. C02c *1/10*
U.S. Cl. 210—7 14 Claims



A method and apparatus for ecologically recycling household organic waste, yard and garden trimmings and prunings, and storm sewerage along with sanitary sewage through an activated sludge treatment process modified to increase its aeration efficiency while eliminating the need for preliminary sedimentation tanks, final sludge digester tanks and the utilization of the communities' natural water resources for the stabilization and the purification of the final effluent discharge by effecting on site utilization of the final effluent discharge through a separation of the sludge component and the nutrient rich liquid component for respectively forming dried commercial fertilizer and/or commercially saleable compost and reducing the nutrient rich liquor to nutrient free water by conveying it as a feeder liquor through a suitably formed hydroponic garden containing commercially saleable plants arranged to extract the nutrients. The apparatus, in addition to the conventionally fitted activated sludge aeration tanks and a final sedimentation tank, provides a grinding unit for grinding the household organic waste and yard and garden trimmings and introducing them at suitable strategic points into the sanitary sewer lines to be conveyed by the sewage effluent to the plant site and delivered, after passage through a mixer to provide thorough mixing, to the aeration sludge tank fitted with a supplemental aeration system which adds to the conventional activated-sludge process a "trickling filter effect" substantially enhancing the aeration and bacterial growth ability of the aeration tank, a sludge removal pump having an outlet alternately adapted to deliver excess sludge to a drier for conversion as an end product to commercial fertilizer or to a spray means for spraying the sludge as a composting catalyst over a chip bed produced by passing yard and garden prunings through a conventional chipper to produce as an end product a rich commercial compost, and a hydroponic garden for extracting the nutrients from the separated nutrient rich liquor to produce as an end product nutrient free water.

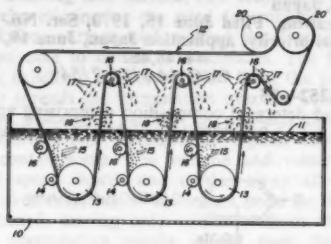
3,728,255
WATER PURIFICATION WITH POROUS ABRASIVES

Steve Eisner, Schenectady, and Carl H. Rowe, Ballston Lake, N.Y., assignors to Norton Company, Troy, N.Y.

Filed May 20, 1971, Ser. No. 145,297
Int. Cl. C02c *5/04*
U.S. Cl. 210—15 11 Claims

Apparatus and methods for purifying water containing oxidizable pollutants are disclosed wherein a porous belt aerates the water by alternatively soaking up water or air and discharging such in the opposite phase. In addition to the aeration function, the porous belt may be made abrasive in nature to generate nascent oxygen and hy-

drogen peroxide which kill undesirable microorganisms, the nascent oxygen and hydrogen peroxide being produced by the abrasive action against the surface of certain materials such as aluminum.



3,728,256

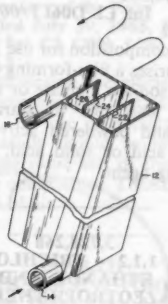
CROSSFLOW CAPILLARY DIALYZER

William W. Cooper IV, Sudbury, Mass., assignor to Abcor, Inc., Cambridge, Mass.

Filed June 22, 1971, Ser. No. 155,471

Int. Cl. B01d *13/00, 31/00*

U.S. Cl. 210—22 **24 Claims**



A crossflow capillary dialyzer particularly useful for the dialyzation of body fluids, such as blood, which dialyzer is characterized by a simple and economic design which promotes the velocity of dialyzate as it flows perpendicular to the capillary fibers in the dialyzer, and which dialyzer comprises a plurality of generally parallel capillary semipermeable membrane fibers enclosed at both ends in potted headers within a shell, and wherein a system of baffles is employed within the dialyzer shell, which baffles provide a tortuous or zig-zag flow path for the dialyzate as it crossflows over the capillaries.

3,728,257

METHODS AND MEANS FOR REMOVING HEAVY METAL IONS FROM LIQUIDS CONTAINING SUCH IONS

Kaj O. H. Fuxelius, Billingsfors, Sweden, assignor to AB Billingsfors-Langed, Billingsfors, Sweden

No Drawing. Filed Feb. 19, 1971, Ser. No. 117,097

Claims priority, application Sweden, Feb. 9, 1971, 1,586/71

Int. Cl. B01d *15/00;* **C02b** *1/14*

U.S. Cl. 210—36 **2 Claims**

The invention relates to methods and means for efficiently removing heavy metal ions from aqueous or other liquids for the purpose of purifying said liquids and/or recovering said metals; said liquids are passed through an absorbent bed which contains a solid absorbent of carbon material having at least one thiol compound pre-adsorbed thereto, said bed having been prepared by passing a liquid or gas containing or consisting of the thiol compound through said carbon material. The invention also relates to a process for producing said absorbent bed.

3,728,258

SELF-EXTINGUISHING FLAMMABLE MIXTURES

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

No Drawing. Filed June 2, 1971, Ser. No. 149,355

Int. Cl. C09k *3/28*

U.S. Cl. 252—8.1 **4 Claims**

Self-extinguishing flammable mixtures are produced and a method provided for reducing the hazards associated with the transportation of flammable liquids. Flammable liquid is mixed with a water microgel system so that the liquid is present in an amount of between 5% to 30% by weight, based on the total weight of the mixture. The resulting mixture may be transported by any suitable means. When the mixture reaches its ultimate destination the two components may be separated by gravitational means such as centrifugation.

3,728,259

COMPOSITION FOR DRILLING WELLS AND METHOD FOR PREPARING SAME

Stanley A. Christman, Los Angeles, Calif., assignor to Esso Production Research Company

No Drawing. Original application May 27, 1970, Ser. No. 41,657, now Patent No. 3,633,689. Divided and this application July 7, 1971, Ser. No. 160,555

Int. Cl. C10m *3/22;* **E21b** *21/04*

U.S. Cl. 252—8.5 C **13 Claims**

Drilling of wells in sub-freezing environments is conducted by using a fluid which contains a major amount of an aqueous medium such as sea water or fresh water, a heteropolysaccharide produced by the action of bacteria of the genus Xanthomonas, an oxygenated hydrocarbon dispersant which may be a polyhydric alcohol such as ethylene glycol and, optionally, an alkaline medium to provide a desired pH, the polyhydric alcohol aiding in the dispersion of the heteropolysaccharide in the aqueous medium and acting as a freezing point depressant of the drilling fluid.

3,728,260

ADDITIVE FOR LUBRICATING COMPOSITION

Peter Flowerday, Slough, Benjamin Thomas Fowler, Abingdon, and Robert Robson, East Hendred, near Wantage, England, assignors to Esso Research and Engineering Company

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,599

Claims priority, application Great Britain, Oct. 24, 1969, 52,217/69

Int. Cl. C10m *1/46*

U.S. Cl. 252—32.5 **15 Claims**

An EP additive package for aviation ester lubes comprises a triaryl phosphate and dialkylamine hydrocarbyl phosphate, optionally in admixture with dihydrocarbyl alkylamine phosphate.

3,728,261

LUBRICATING GREASE

Bill Mitacek, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,417

Int. Cl. C10m *1/24, 1/18*

U.S. Cl. 252—41 **7 Claims**

Lubricating greases are improved as to bleeding, water wash-out, and wheel bearing leakage properties by the addition of a hydrogenated butadiene-styrene copolymer.

3,728,262

METHOD OF MANUFACTURING A MAGNETIC TAPE LACQUER

Hendrikus Johannes Lemmen, Johannes van Ruler, and Pieter Cornelis Scholten, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Mar. 8, 1971, Ser. No. 122,097
Claims priority, application Netherlands, Mar. 18, 1970, 7003810
Int. Cl. H01f 1/26
U.S. Cl. 252—62.54 3 Claims

A method of manufacturing a magnetic tape lacquer in which a polymer is used as a dispersing agent for the magnetisable particles. When using hydrolized vinylchloride-vinyl acetate, suitable solvents are 1,2-dichloroethane, diisobutylketone and nitrobenzene.

3,728,263

PIEZOELECTRIC CERAMIC COMPOSITIONS

Masamitsu Nishida, Osaka, and Hirumu Ouchi, Toyonaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

No Drawing. Filed May 5, 1971, Ser. No. 140,565
Claims priority, application Japan, May 19, 1970, 45/43,183; May 25, 1970, 45/45,322
Int. Cl. C04b 35/46, 35/48
U.S. Cl. 252—62.9 14 Claims

Piezoelectric ceramic compositions having very high mechanical quality factors, high electromechanical coupling coefficients and highly stable dielectric constants over a wide temperature range, and comprising the ternary system $Pb(Zn_{1/2}Nb_{2/3})O_3$-$PbTiO_3$-$PbZrO_3$ and containing 0.1 to 5 weight percent of MnO_2, and further containing at least one oxide selected from the group consisting of 0.03 to 2.5 weight percent aluminum oxide and 0.05 to 5 weight percent stannic oxide.

3,728,264

PIPE CLEANING FLUID

Jean Florent Widlocher, 133, Rue de Cherche-Midi, Paris, France

Filed Feb. 19, 1971, Ser. No. 117,106
Claims priority, application France, Feb. 26, 1970, 7007003
Int. Cl. C02b 5/06
U.S. Cl. 252—83 3 Claims

Pipe cleaning fluid comprises digallic acid, and other impurities derived from ground briar root and the like, dissolved in a suitable solvent.

3,728,265

HIGH-FOAMING LIQUID DETERGENT COMPOSITIONS

John Anthony Cella, Lake Forest, and Thomas Oliver York, Chicago, Ill., and William Howard Schmitt, Branford, Conn., assignors to Alberto-Culver Company, Melrose Park, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 9,976, Feb. 9, 1970. This application Dec. 16, 1971, Ser. No. 209,898
Int. Cl. C11d 17/00
U.S. Cl. 252—90 9 Claims

High-foaming liquid detergent compositions, adapted to be packaged in conventional non-pressurized containers as, for example, glass bottles and metal or plastic containers, comprising substantially anhydrous compositions containing a compressible water-insoluble gas, particularly in the form of an aliphatic hydrocarbon or halogenated hydrocarbon, dissolved in an organic solvent, such as propylene glycol, which organic solvent is also water-soluble, and certain other agents to complete the liquid detergent compositions for their intended uses, such as hair shampoos. When said compositions are wetted or admixed with water, said dissolved compressible gas is displaced from said organic solvent and is released to form extremely profuse or large amounts of foams or suds.

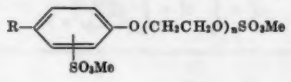
3,728,266

LIQUID DETERGENT COMPOSITION

Yoshiaki Komeda, Tokyo, and Yunosuke Nakagawa, Koshigawa, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

No Drawing. Filed June 15, 1970, Ser. No. 46,485
Claims priority, application Japan, June 19, 1969, 44/48,467
Int. Cl. C11d 1/24, 7/54
U.S. Cl. 252—95 3 Claims

A liquid detergent composition comprising an aqueous solution of (A) 0.1–80% by weight of a compound of the formula



wherein R is an alkyl of 8–22C, Me is an alkali metal and $40 \geqq n \geqq 1$, and (B) 1.0–60.0% by weight of a water soluble inorganic compound.

3,728,267

PEELING TYPE PICKLING COMPOSITIONS

Nobuyoshi Hirota and Tsutomu Matsushita, Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,917
Claims priority, application Japan, Jan. 14, 1970, 45/3,722; Oct. 9, 1970, 45/88,525; Nov. 25, 1970, 45/104,561
Int. Cl. D06l 1/00
U.S. Cl. 252—142 5 Claims

A peeling type composition for use in the pickling treatment, which comprises a film-forming composition consisting essentially of sodium alginate or sodium alginate and gelatin, with at least one of starch, bentonite, talc, powdered silica and powdered active terra alba added thereto; a liquid acid or solid acid; a penetrant; and a solution promoting agent.

3,728,268

MIXTURES OF 1,1,2 - TRICHLORO-1,2,2-TRIFLUOROETHANE, ETHANOL AND ACETONE AND A TERNARY AZEOTROPE THEREOF

James Gordon Burt, Oxford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 11, 1970, Ser. No. 97,141
Int. Cl. C09d 9/00; C11d 7/50; C23g 5/02
U.S. Cl. 252—170 2 Claims

A mixture of 1,1,2-trichloro-1,2,2-trifluoroethane, ethanol and acetone and a ternary azeotrope thereof, said mixture containing from about 82.3 to about 89.2 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane and from about 0.8 to about 4.5 weight percent ethanol and said azeotrope containing about 86.4 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane and about 1.6 weight percent ethanol and having a minimum boiling point of about 43.6° C.

3,728,269

VOLATILE CLEANING COMPOSITION

George M. Stephenson, Wilton, Conn., and John Frangos, New York, N.Y.; said Frangos assignor to said Stephenson

Filed Mar. 23, 1970, Ser. No. 21,725
Int. Cl. C09d 9/04; C11d 2/50; C23g 5/02
U.S. Cl. 252—171 1 Claim

A new surface cleaner that is substantially completely volatile, requires no surface rubbing, can be utilized in a pressurized container, a degreasing or ultrasonic cleaning tank, a pump dispenser or other liquid delivery and dispensing systems, and comprises two or more readily volatilizable alcohols in solution with a surface active

agent and a grease solvent. When packaged in pressurized containers or pump dispensers, the cleaner is capable of being sprayed as a liquid onto the surface to be cleaned, cleaning that surface, and completely evaporating, thereby eliminating the need for rubbing or wiping the workpiece surface and making the cleaner particularly applicable to optical lens surfaces. The force generated in expelling the formulation from the pressurized container spreads the formulation over the surface, loosening and dislodging particles of dirt and dust thereon while dissolving oils, waxes, salts—organic and inorganic surface contaminants. The volume and velocity of the delivered spray sluices and carries away all dislodged and dissolved materials to the lowest point on the surface being cleaned, leaving only a thin uniform film of the cleaning formulation evenly spread over the surface, which then evaporates substantially completely, leaving no visible residual film or spots. When the cleaning composition is contained in a degreasing or ultrasonic cleaning tank, the surface to be cleaned is dipped into the solution and, upon withdrawal of the surface from the tank, the cleaner will evaporatively run off carrying away the dissolved organic and inorganic substances with it, leaving a clean, residue-free surface.

3,728,270

CHEMILUMINESCENT FORMULATION CONTAINING INORGANIC SALT SOLUTION

Everett M. Bens and Carl H. Morley, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed July 30, 1965, Ser. No. 476,789
Int. Cl. C09k *3/00*
U.S. Cl. 252—188.3 **4 Claims**

A method for increasing the efficiency in chemiluminescence of the composition, tetrakis(dimethylamino) ethylene (TMAE), for use in nocturnal markers where fire retardant materials should be utilized which comprises adding an inorganic salt of the alkali or alkaline earth metals to the composition TMAE at room temperature in the absence of air.

3,728,271

CHEMILUMINESCENT FORMULATION

William S. McEwan, China Lake, Calif., Hans B. Jonassen, New Orleans, La., and Carl H. Morley, Ridgecrest, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Feb. 26, 1969, Ser. No. 803,526
Int. Cl. C09k *1/06*
U.S. Cl. 252—188.3 CL **6 Claims**

An improved chemiluminescent formulation consisting essentially of tetrakis(disubstituted-amino)ethylene, polyethylene and a lithium halide for use in climates where the humidity reaches 85% or higher.

3,728,272

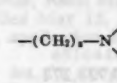
METHOD OF PRODUCING SODIUM ALUMINUM HYDRIDES

Bohuslav Casensky, 6 E. Krasnohorske, Prague I, Czechoslovakia; Jiri Machacek, 66 Hlavni, Krumvir, Czechoslovakia; and Jaroslav Vit, % Peter Andrews, P.O. Box 8145, SW. Station, Washington, D.C. 20024

No Drawing. Application Mar. 24, 1967, Ser. No. 626,664, now Patent No. 3,507,895, dated Apr. 21, 1970, which is a continuation-in-part of abandoned application Ser. No. 611,845, Jan. 26, 1967. Divided and this application Mar. 25, 1970, Ser. No. 22,669
Claims priority, application Czechoslovakia, Jan. 31, 1966, 604/66; Mar. 22, 1966, 1,906/66; Mar. 26, 1966, 2,009/66
Int. Cl. C01b *6/24, 6/28*
U.S. Cl. 252—188 **3 Claims**

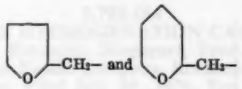
Liquid reactant for use in reducing and halogenating reactions comprising a solution in benzene, toluene, xylene or tetrahydrofuran of

(a) a compound of the formula $NaAlH_2OR$ wherein



z is 2 to 4 and R^1 and R^2 are the same or different and are selected from the group consisting of $O(CH_2)_z$, alkyl of 1 to 4 carbon atoms and an aliphatic ether group having a total of 2 to 4 carbon atoms and z has the same meaning as above, or

(b) a compound of the formula $NaAlH_x(OR^3)_{4-x}$, wherein x is 1 or 2 and R^3 is (alkylene $O)_yR^4$, wherein alkylene has 2 to 4 carbon atoms, y is 1 to 4 and R^4 is selected from the group consisting of alkyl of 1 to 4 carbon atoms, phenyl,



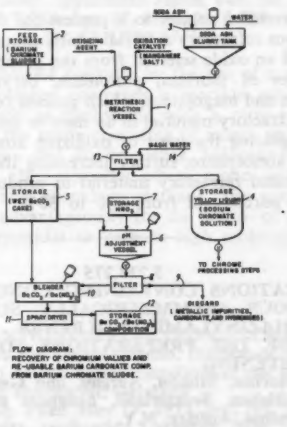
A specific compound coming under the second of these groups is sodium dihydro-bis-(2-methoxy-ethoxy)-aluminate of the formula $NaAlH_2(OCH_2CH_2OCH_3)_2$.

3,728,273

METHOD OF RECOVERING CHROMIUM AND BARIUM VALUES FROM WASTE BARIUM CHROMATE

Charles P. Bruen, Bernardsville, N.J., and Christian A. Wamser, Camillus, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 27, 1971, Ser. No. 183,969
Int. Cl. C09k *3/00;* **H05b** *33/00*
U.S. Cl. 252—182 **23 Claims**



Recovery of chromium values and a re-usable barium carbonate composition from barium chromate waste treatment sludges, by digestion in an aqueous medium with at least a 100% stoichiometric excess of sodium carbonate, at temperatures between 80 and 250° C. A solution of sodium chromate "yellow liquor" is separated from the solid barium carbonate, a portion of

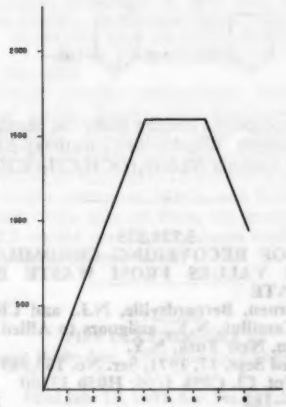
which is dissolved in nitric acid at a pH of 4.5 to 5.5 as a means of purging insoluble impurities. The separated barium nitrate is recombined with the balance of the barium carbonate to provide the re-usable barium carbonate composition.

3,728,274

PROCESS FOR PREPARING SPHERES OF URANIUM OXIDE AND URANIUM OXIDE-PLUTONIUM OXIDE, HAVING A CONTROLLED POROSITY

Panayotis Gerontopoulos, Livorno, Dino Neri, Pisa, and Ruggero Renzoni, Milan, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed Dec. 5, 1969, Ser. No. 882,508
Claims priority, application Italy, Jan. 8, 1969, 11,249/69
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 R **16 Claims**



This invention relates to a process for the production of a porous refractory material which comprises uranium oxide and an oxide selected from the group consisting of the oxides of thorium, plutonium, beryllium, silicon, aluminum and magnesium, which process comprises heating the refractory material in an inert or oxidizing atmosphere, replacing the inert or oxidizing atmosphere by a reducing atmosphere, further increasing the temperature of the heated refractory material to produce a material having a porosity of from 2% to 30%.

3,728,275

PREPARATIONS CONTAINING CONCENTRATED AQUEOUS ASYMMETRICALLY SUBSTITUTED BIS-TRIAZINYLAMINOSTILBENES AND THE USE OF THE PREPARATIONS FOR OPTICAL BRIGHTENING

Paul Horlacher, Mohlin, Aargau, and Gerhard Creutzburg, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 13, 1970, Ser. No. 80,485
Int. Cl. D06l *3/12*
U.S. Cl. 252—301.2 W **5 Claims**

Mixtures of new asymmetrically substituted bis-triazinylaminostilbenes are optical brighteners for organic materials. The mixtures are prepared by reacting cyanuric chloride with an aminobenzenesulfonic acid, 4,4'-diaminostilbene-2,2'-disulfonic acid and a mixture of an isomer mixture of dimethylmorpholines and diethanolamine.

3,728,276

PRESSURIZED FOAM-PRODUCING COMPOSITION AND PROCESS THEREFOR

George Lieberman, 13537 Mineola St., Pacoima, Calif. 91332; and Victor J. Pierce, 2040 Vestal 90026; and Samuel B. Prussin, 2126 Banyan Drive 90049, both of Los Angeles, Calif.

No Drawing. Continuation of application Ser. No. 601,837, Dec. 15, 1966, which is a continuation-in-part of application Ser. No. 519,445, Jan. 10, 1966. This application Feb. 20, 1970, Ser. No. 14,714
Int. Cl. A61k *7/00*; A61l *9/04*; C09k *3/30*
U.S. Cl. 252—305 **10 Claims**

A pressurized foam-producing composition comprising 75 to 95 percent by weight of a chlorofluorocarbon propellent system having a vapor pressure of 10 to 30 pounds per square inch gauge at 70° F. emulsified as the dispersed phase in an aqueous continuous phase in the presence of an emulsifier in an amount sufficient to yield a stable emulsion, the composition upon the release of pressure forming a foam which exhibits a crackling sound when subjected to shear.

3,728,277

STABLE WATER-IN-OIL EMULSIONS

John T. Foley, Readington Township, N.J., assignor to Witco Chemical Corporation, New York, N.Y.

No Drawing. Original application Jan. 12, 1970, Ser. No. 2,357, now Patent No. 3,654,117. Divided and this application Nov. 3, 1971, Ser. No. 195,517
Int. Cl. B01j *13/00*
U.S. Cl. 252—309 **8 Claims**

Water-in-oil emulsions containing emulsifier compositions comprising admixtures of (a) an imidazoline or oxazoline salt of a long chain fatty acid and (b) a salt of a long chain aliphatic amido amine and a long chain aliphatic carboxylic acid, said water-in-oil emulsions exhibiting excellent heat stability and metal coating properties for corrosion inhibition.

3,728,278

CATIONIC EMULSIONS

Michael C. Tramelli, Great Falls, Mont., assignor to Phillips Petroleum Company

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,229
Int. Cl. B01j *13/00*; C08h *13/00*
U.S. Cl. 252—311.5 **5 Claims**

An improved cationic asphalt-in-water emulsion consisting of asphalt, water, a metallic salt, an inorganic acid, and a combination of cationic emulsifying agents which enables emulsions to be prepared which have less asphalt at specification viscosities, thereby reducing the cost of the emulsion.

3,728,279

METHOD AND COMPOSITION FOR THE EMULSIFICATION AND THE DEGRADATION OF PETROLEUM PRODUCTS AND FERTILIZERS THUS OBTAINED

Georges Henri Salomone, 14 Avenue Pierre Ier de Serbie, Paris, France

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,105
Claims priority, application France, Feb. 3, 1970, 7003764
Int. Cl. B01j *13/00*
U.S. Cl. 252—312 **2 Claims**

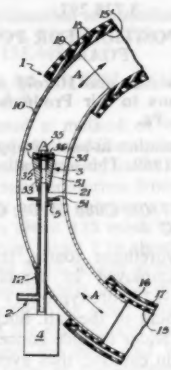
Petroleum products are rendered bio-degradable to produce fertilizer, by admixing therewith, per 100 parts by weight of petroleum product, 50 to 250 parts by weight of a mixture which is 15 to 80 parts by weight of a carbohydrate or protein nutrient for microorganisms, 10 to 50 parts by weight of a surface-active agent that reduces the surface tension, and a diluent which may be either 5 to 60 parts by weight of water, or 150 to 400% by weight of the total weight of the substance in the form of an absorbent powder.

3,728,280

PROCESS AND A DEVICE FOR THE CONTINUOUS PREPARATION OF EMULSIONS

Theo Sauer, Starnberg, and Dr. Gunter Schulz, Holzkirchen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 16, 1971, Ser. No. 115,625
Claims priority, application Germany, Mar. 12, 1970, P 20 11 667.0
Int. Cl. B01f 5/04; B01j 13/00
U.S. Cl. 252—314 11 Claims



Emulsions, such as suspensions containing silver halide, are prepared wherein the basic component and the resulting deposit are conducted in rising current. Further components are delivered into the basic component at sequentially arranged inlet points and are dispersed by means of the cross-current with the radially directed or pulsating cross-current being overlapped with oscillations directed in an axial direction to the tubular body in which the current flows.

3,728,281

CORROSION INHIBITING COMPOSITION CONTAINING HYDRAZINE AND A PYRAZOLIDONE OR AN AMINOPHENOL

Colin Elliott Marks, Quorn, and John Miller, Mapperley, England, assignors to Fisons Limited, Suffolk, England

Filed Mar. 31, 1971, Ser. No. 129,690
Claims priority, application Great Britain, Apr. 2, 1970, 15,570/70; May 13, 1970, 23,047/70
Int. Cl. C23f 11/14, 11/18
U.S. Cl. 252—392 18 Claims

An aqueous composition for inhibiting corrosion in systems containing hot water comprises hydrazine and at least one activating compound which may be a pyrazolidone or an aminophenol.

3,728,282

LIQUID STABILIZERS FOR VINYL CHLORIDE POLYMERS

Walter P. Barie, Jr., Shaler Township, Allegheny County, Norman W. Franke, Penn Hills Township, Allegheny County, and Gary M. Singerman, Monroeville Borough, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,603
Int. Cl. B01j 1/16; C08f 45/56
U.S. Cl. 252—400 6 Claims

The stabilization of polyvinyl chloride resins and polyvinyl chloride resin compositions with novel storage-stable liquid compositions comprising metal salts of linear aliphatic monocarboxylic acids, an acidic organophosphite or an acidic organophosphate and a hydrocarbon solvent.

3,728,283

MODIFIED Al-Nn CATALYST FOR DIMERIZING OLEFINS

Yves Chauvin, Saint Germain en Laye, and Jean Gaillard, Carrieres-sur-Seine, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

No Drawing. Filed May 15, 1970, Ser. No. 37,878
Claims priority, application France, May 20, 1969, 6916444
Int. Cl. C07c 3/10
U.S. Cl. 252—429 B 16 Claims

This invention relates to the manufacture of a dimerization catalyst, to the catalyst thus obtained and to a process for dimerizing olefins with the said catalyst.

The catalyst is manufacture by reacting a dihydrocarbyl aluminum monohalide with a controlled amount of water at a temperature less than 20° C., then separating the insoluble fraction and thereafter contacting the soluble fraction with nickel or a nickel compound.

The catalyst is preferably used at temperatures higher than 25° C.

3,728,284

NITRILE HYDROGENATION CATALYST

Jefferson W. Reynolds, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed July 29, 1970, Ser. No. 59,368
Int. Cl. B01j 11/22, 11/32
U.S. Cl. 252—459 4 Claims

A hydrogenation catalyst of high activity, good crush strength and strong resistance to disintegration when employed in a fixed-bed hydrogenation process comprising a hydrogen-reduced mixture of sodium silicate and cobalt oxide in a weight ratio of sodium silicate:cobalt oxide of about 1:1 to 1:9.

3,728,285

CATALYST AND USE THEREOF FOR THE POLYMERIZATION OF EPOXIDES

Junji Furukawa, Koto, Nariyoshi Kawabata, Osaka, and Mikio Nakaniwa and Saburo Kanbara, Kyoto, Japan, assignors to Maruzen Petrochemical Company Limited, Tokyo, and The Toyo Rubber Industry Co., Osaka, Japan

No Drawing. Filed Feb. 8, 1967, Ser. No. 614,550
Claims priority, application Japan, Feb. 10, 1966, 41/7,386; Jan. 27, 1967, 42/5,000
Int. Cl. C08g 23/14
U.S. Cl. 260—2 A 10 Claims

Polymerization of epoxides by the use of a catalyst is shown. The catalyst comprises a reaction product of a dialkylzinc such as diethylzinc with a nitro compound selected from the group consisting of mono- and di-nitroparaffins, mono- and di-nitroolefins, halogene-substituted nitroparaffins, alkyl-nitroalkyl ethers, mono- and di-nitrocycloalkanes and phenylnitromethane. The catalyst may also be used advantageously for the homo- or co-polymerization of epoxides to prepare high molecular weight polyepoxides.

3,728,286

PYRAZOLANTHRONE ELECTRON EXCHANGERS

Reiner Welters and Dieter Randau, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed May 19, 1971, Ser. No. 145,003
Claims priority, application Germany, May 19, 1970, P 20 24 268.6
Int. Cl. C08f 19/20, 19/00
U.S. Cl. 260—2.2 R 22 Claims

Improved water insoluble, water swellable redox polymers having a substantially inert hydrophilic polymeric portion and an electron exchanging redox portion covalently bonded thereto wherein the redox portion is an N-bonded pyrazolanthrone group.

3,728,287

HYDROLYZING POLYESTER

Chester F. Burmaster, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 18, 1971, Ser. No. 190,291

Int. Cl. C08g *53/22*

U.S. Cl. 260—2.3 7 Claims

A process hydrolyzing polyesters comprising intermixing polyester articles and caustic 2-methoxyethanol or 2-ethoxyethanol and heating the resulting mixture for a short period of time.

3,728,288

IMPACT-RESISTANT RIGID POLYURETHANE FOAM COMPOSITIONS AND PROCESS OF MANUFACTURE

Walter H. Cobbs, Jr., Princeton, N.J., and Donald Dunn, Cincinnati, and Victor G. Soukup, Wyoming, Ohio, assignors to Cincinnati Milacron, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 654,853, July 20, 1967. This application May 18, 1970, Ser. No. 38,514

Int. Cl. C08g *22/48*

U.S. Cl. 260—2.5 BD 5 Claims

Improved rigid polyurethane foam compositions are obtained whose brittleness is substantially reduced and impact resistance increased by prereaction of a polyisocyanate with a relatively minor amount of a difunctional organic compound and thereafter reacting the thus formed NCO terminated prepolymer with a polyhydroxy compound in the presence of a blowing agent and, optionally, a catalyst and surfactant. The resultant foam is employable in molding operations to produce improved molded articles.

3,728,289

ELASTIC, TEAR-RESISTANT, HIGH-DENSITY FOAMS BASED ON POLYCARBODIIMIDE-POLYISOCYANATES

Franz Gottfried Reuter and Walter Fensch, Hannover, Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of application Ser. No. 677,740, Oct. 24, 1967. This application Oct. 26, 1970, Ser. No. 84,145

Claims priority, application Germany, Sept. 29, 1965, P 12 64 764.2

Int. Cl. C08g *22/46*

U.S. Cl. 260—2.5 BF 7 Claims

Process for the manufacture of highly-elastic tear-resistant polyurethane foams of relatively high density by a one step process which comprises reacting (1) a mixture comprising a linear polyhydroxyl compound having a molecular weight of about 1,000 to about 3,000, a chain extender such as a bifunctional glycol, a catalyst, and water with (2) a polyisocyanate having a melting point below about 25° C. which is a diisocyanate modified by reaction with carbodiimide or a mixture of a diisocyanate and the reaction product of a diisocyanate and a carbodiimide.

3,728,290

METHOD FOR THE PREPARATION OF A SEPARATION MEDIUM FOR GEL FILTRATION

Ingemar Haldor Johansson and Marius Klaus Joustra, Uppsala, Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,664

Claims priority, application Sweden, Apr. 29, 1970, 5,958/70

Int. Cl. B01d *39/04*; C08f *33/08, 47/08*

U.S. Cl. 260—2.5 N 12 Claims

The present invention relates to an improved method for preparing a separating medium for gel filtration in which grains of a rigid hydrophilic macroporous copolymer of acrylamide (or 1-vinyl-12-pyrrolidinone) with N,N'-methylene-bis-acrylamide has copolymerized in its pores a second copolymer of one or more acrylamides (or 1-vinyl - 2 - pyrrolidinone) within N,N'-methylene-bis-acrylamide in the presence of an initiator (as set forth in U.S.P. 3,616,936) characterized in that the initiator is present in the pores of the rigid hydrophilic, macroporous copolymer when the copolymerizable substances of said second copolymer are introduced thereinto.

3,728,291

CATALYST COMPOSITION FOR POLYURETHANE FOAM

Felix P. Carroll, Chester, and Harold A. Green, Havertown, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 842,692, July 17, 1969. This application June 21, 1971, Ser. No. 155,226

Int. Cl. C08c *17/08*; C08d *13/08*; C08f *47/10*

U.S. Cl. 260—2.5 AC 5 Claims

In preparing polyurethane foams, triethylenediamine diformate salt is employed in combination with an amount of HPI (1-(2-hydroxypropyl) imidazole) not greater than the amount of the salt. Such amine catalyst compositions permit wider latitude concerning concentration of the organic tin catalyst, thus avoiding the critical sensitivity to concentration when using triethylenediamine alone as the amine catalyst. The blend of formate salt and HPI has other significant advantages over previously taught catalysts.

3,728,292

POLYAMIDES FOAMED WITH N-SUBSTITUTED CARBAMIC ESTER BLOWING AGENTS

Harry McGrath, Raymond Frederick Moore, and Eric Smith, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation of abandoned application Ser. No. 834,897, June 19, 1969. This application July 16, 1971, Ser. No. 163,454

Claims priority, application Great Britain, June 27, 1968, 30,757/68

Int. Cl. C08g *53/08*

U.S. Cl. 260—2.5 N 12 Claims

Manufacture of rigid nylon foam by the use of N-substituted carbamic esters as blowing agents, especially the carbamic esters from bis-isocyanates and monofunctional alcohols and those from heterocyclic NH compounds and alkyl chloroformates.

3,728,293

POLYURETHANE COMPOSITIONS CONTAINING PHENOL-ALDEHYDE RESINS AND POLYETHER POLYOLS

Llewellyn D. Booth, Lake Jackson, and Kenneth J. Hinze, Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 98,139, Dec. 14, 1970, which is a continuation-in-part of application Ser. No. 781,259, Dec. 4, 1968, now abandoned. This application Mar. 13, 1972, Ser. No. 234,320

Int. Cl. C08g *5/10, 5/18*

U.S. Cl. 260—17.2 5 Claims

The invention concerns non-cellular polyurethane compositions derived from acid catalyzed phenol-aldehyde

resins (novolacs) and polyisocyanates. It relates more particularly to non-cellular polyurethane compositions derived from polyether polyols, novolac resins and polyisocyanates.

3,728,294

METHOD OF BLENDING REINFORCING FIBERS AND MOLDING RESINS AND PRODUCT THEREOF

Marvin S. Levine, Hazel Crest, Ill., assignor to General American Transportation Corporation, Chicago, Ill.

No Drawing. Continuation of abandoned application Ser. No. 685,972, Nov. 27, 1967. This application Apr. 19, 1971, Ser. No. 135,449

Int. Cl. C08f *45/10*

U.S. Cl. 260—29.1 B 5 Claims

There is disclosed a method of blending reinforcing fibers and thermoplastic molding resins, the molding mixture resulting therefrom being useful in injection molding and the like; the resin comprises from about 60 to about 93 parts by weight of the mixture and has a particle size in the range from about 125 mesh to about ⅛ inch, the fiber comprises from about 7 to about 40 parts by weight of the mixture and has a length in the range from about 125 mesh to about ½ inch, and a dispersant is provided in the mixture comprising from about 0.1 to about 0.5 part by weight of the mixture and being compatible with both the resin and the fiber and leaving substantially unchanged the nature of the molded compound formed thereform, the ratio by weight between the resin and the fiber being in the range from about 1.5:1 to about 15:1 and the ratio by weight between the dispersant and the fiber being in the range from about 1:200 to about 1:15; the fibers and the dispersant are mixed in a commercial blending machine for a time interval of from about 1 to about 3 minutes so as uniformly to disperse the dispersant on the surface of the fibers, and thereafter the resin is added thereto and the ingredients mixed for a time interval of from about 5 minutes to about 15 minutes to produce the molding mixture, whereby to provide a molding mixture wherein the resin and the fiber and the dispersant are thoroughly mixed and dispersed throughout the body of the mixture so as to maintain the resin and the fiber in a uniformly dispersed relationship during the storage of the molding mixture and during the handling and molding of the molding mixture into a molded compound.

3,728,295

DILATANT LATEX OF AT LEAST TWO ALIPHATIC MONO-UNSATURATED ESTERS AND AN ALIPHATIC MONO-UNSATURATED CARBOXYLIC ACID

Earl L. Skinner, Homewood, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Continuation-in-part of abandoned application Ser. No. 735,271, June 7, 1968. This application Feb. 25, 1971, Ser. No. 118,877

Int. Cl. C08f *29/38*

U.S. Cl. 260—29.6 TA 33 Claims

There is provided a dilatant latex formed from a plurality of monomers including at least two aliphatic mono-unsaturated esters and a small amount of an aliphatic mono-unsaturated carboxylic acid. The polymer is formed by an emulsion polymerization technique carried out in the presence of a water-soluble polyhydric alcohol which is a nonsolvent or substantially a nonsolvent for the polymer. There are also provided novel coating compositions in which this product may be used as a paint vehicle component or used as an additive to other latex type paint vehicles to adjust the rheological properties of the system.

3,728,296

STABLE SOLUTIONS OF POLYGLUTAMIC ACID DERIVATIVES

Yasuo Fujimoto and Masayuki Teranishi, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,260

Claims priority, application Japan, Feb. 10, 1970, 45/11,123

Int. Cl. C08g *51/30, 51/34*

U.S. Cl. 260—30.4 N 22 Claims

Stable solutions of polyglutamic acid derivatives, useful for forming films or artificial leathers, are produced by adding a polyether polyol or an alkylenediamine polyether polyol to an inert organic solvent solution of a polymer of an N-carboxylic acid anhydride of a glutamic acid γ-ester.

3,728,297

PYRAZOLYL ESTERS OF PHOSPHORIC ACIDS

Hellmut Hoffmann, Wuppertal-Elberfeld, Ingeborg Hammann, Cologne, and Gunter Unterstenhofer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

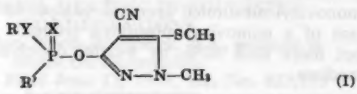
No Drawing. Filed Aug. 17, 1970, Ser. No. 64,668

Claims priority, application Germany, Aug. 21, 1969, P 19 42 561.7

Int. Cl. C07f *9/08, 9/16, 9/38*

U.S. Cl. 260—310 R 7 Claims

1-methyl-4-cyano - 5 - methylmercapto-pyrazol-(3)-yl esters of O,O-dialkyl-phosphoric acids or O-alkyl-alkane-phosphonic acids or mono- or di-amides of phosphoric or phosphonic acids or their thiono analogues, having the formula



(I)

in which

R denotes a straight-chain or branched alkyl radical,
R′ denotes a straight-chain or branched alkyl radical or an alkoxy, alkylamino or dialkylamino radical,
Y denotes an oxygen atom or an imino or alkylimino group, and
X denotes an oxygen or sulphur atom, the alkyl radicals of R, R′ and Y having from 1 to 6 carbon atoms,

which possess arthropodicidal, especially acaricidal and insecticidal, and in some cases rodenticidal, properties and process for their preparation.

3,728,298

POLYURETHANE PRINTING INK AND METHOD OF USING SAME

George Hartmann, 69—43 Nansen St., Forest Hills, N.Y. 11375

Filed Sept. 4, 1970, Ser. No. 69,666

Int. Cl. C08g *51/42*

U.S. Cl. 260—31.4 R 4 Claims

A printing ink formed from liquid urethane polymer of polyether type, having an extended pot life. Variation in formulation permits control of viscosity, color and elasticity. The ink may be applied by direct or transfer printing to smooth, textured surfaces and to textile surfaces with surface adherence or pressed into the weave or knit to control stretchability of the fabric in localized areas.

3,728,299

TEXTILE SIZING SOLUTION COMPRISING AN INTERPOLYMER OF A HYDROPHOBIC MONOMER AND AN UNSATURATED ORGANIC CARBOXYLIC MONOMER AND A HALOGENATED HYDROCARBON SOLVENT

Charles K. Schramm, Westfield, N.J., assignor to Colloids, Inc., Newark, N.J.

No Drawing. Filed Jan. 22, 1971, Ser. No. 108,956
Int. Cl. C08f *45/30;* D06m *15/00*
U.S. Cl. 260—33.8 UA 8 Claims

A process for sizing textile yarns wherein the textile yarn is subjected to an organic solvent solution of an interpolymer of a hydrophobic monomer and an unsaturated organic carboxylic monomer containing 3 to 9 carbon atoms and at least 1 carboxyl group, and the organic solvent is thereafter removed.

3,728,300

PROCESS FOR PRODUCING POLYMER BLENDS

Saburo Minekawa, Yokohama-shi, Koretaka Yamaguchi, Kawasaki-shi, Kazuo Toyomoto and Einosuke Fujimoto, Yokohama-shi, and Kuniaki Sakamoto, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1968, Ser. No. 751,545
Claims priority, application Japan, Aug. 26, 1967, 42/54,503
Int. Cl. C08f *19/06, 45/02, 45/28*
U.S. Cl. 260—33.6 AQ 10 Claims

Process for producing a uniformly mixed polymer blend of a great utility as a rubber material for producing various rubber products which comprises copolymerising a conjugated diolefin with a monovinyl-substituted aromatic compound to produce a random copolymer of the conjugated diolefin and the monovinyl-substituted aromatic compound having a content of the monovinyl-substituted aromatic compound of 50–95% by weight in the presence of a conjugated diolefin homopolymer or a random copolymer of a diolefin and a monovinyl-substituted aromatic compound having a content of a monovinyl-substituted aromatic compound of not more than 40% by weight, dissolved in an inert medium.

3,728,301

DISPERSIONS

David Hugh Spence and Arthur Topham, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Aug. 13, 1970, Ser. No. 63,642
Claims priority, application Great Britain, Aug. 18, 1969, 41,058/69
Int. Cl. C08g *51/02, 51/28, 51/30*
U.S. Cl. 260—33.6 R 13 Claims

A composition of matter comprising a dispersion of a solid, preferably a pigment, dyestuff or textile finishing agent, in an organic solvent and a polyurea essentially free from basic amino groups which contains at least two urea groups and at least two alkyl, alkenyl or alkapolyenyl groups containing at least eight carbon atoms, said polyurea being soluble in the organic solvent, and the use of the said compositions of matter.

3,728,302

HEAT HARDENABLE THICKENED EPOXY RESIN MASSES

Dietrich Helm, Unna, Germany, assignor to Schering AG, Bergkaman, Germany

No Drawing. Filed June 7, 1971, Ser. No. 150,755
Claims priority, application Germany, June 12, 1970, P 20 30 054.3
Int. Cl. C08g *51/04, 51/10*
U.S. Cl. 260—37 EP 8 Claims

Heat-hardenable epoxy resin masses ranging from a soft to a brittle consistency prepared by thickening, at a temperature from 20° C. to 120° C., a mixture of (1) a liquid epoxy resin, (2) dicyandiamide, and (3) a tertiary amine accelerator, in the presence of a monoamine or diamine. Further heating of the masses at 150° C.–180° C. causes the storage-stable hardenable masses to harden.

3,728,303

HEAT STABILIZED VINYLIDENE FLUORIDE POLYMER

Yutaka Kometani, Nishinomiya, Shun Koizumi, Osaka, and Takesi Suzuki and Chuzo Okuno, Settu, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka-fu, Japan

No Drawing. Continuation-in-part of application Ser. No. 689,800, Dec. 12, 1967. This application Oct. 7, 1970, Ser. No. 78,967
Claims priority, application Japan, Dec. 12, 1966, 41/81,422
Int. Cl. C08f *45/56*
U.S. Cl. 260—45.7 R 6 Claims

Polyvinylidene fluoride stabilized against heat, especially furnished with stability at a high temperature around 260° C., containing from 0.01 to 5% by weight of at least one of sodium chloride, sodium chlorate, potassium chloride and potassium chlorate.

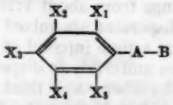
3,728,304

FLAME-RETARDING ORGANIC SYNTHETIC HIGH POLYMER COMPOSITION

Shoichi Hirao and Akira Taniuchi, Kyoto, Takuji Nakano, Suita, and Masahiko Miyazaki, Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

No Drawing. Filed Mar. 2, 1971, Ser. No. 120,344
Claims priority, application Japan, Mar. 13, 1970, 45/21,746
Int. Cl. C09k *3/28*
U.S. Cl. 260—45.75 K 8 Claims

A halogen-containing organic compound, which is represented by the formula,



wherein X_1, X_2, X_3, X_4 and X_5 are individually an alkyl, haloalkyl, alkoxy or haloalkoxy group having 1 to 3 carbon atoms, or a halogen or hydrogen atom; A is an oxygen or sulfur atom; and B is a branched-chain alkyl, haloalkyl, hydroxyalkyl or hydroxyhaloalkyl group having 4 or more carbon atoms, and which compound has at least one halogen atom in the molecule, imparts excellent flame-retardancy to an organic synthetic high polymer and, at the same time, scarcely bleeds in said high polymer, is excellent in compatibility therewith and further imparts plasticity thereto.

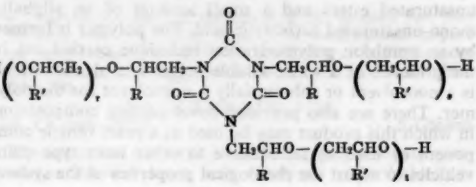
3,728,305

PROCESS FOR PREPARING AN IMPROVED ANTISTATIC FIBER CONTAINING HIGH MOLECULAR WEIGHT TRIS(β - HYDROXYALKYL)-ISOCYANURATE-ALKYLENE OXIDE ADDUCTS

Rodney Lee Wells, Chester, Va., assignor to Allied Chemical Corporation, New York, N.Y.

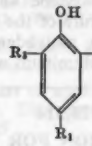
No Drawing. Filed May 30, 1972, Ser. No. 257,869
Int. Cl. C08g *51/58*
U.S. Cl. 260—45.85 10 Claims

It has been suggested that the utility of synthetic fibers of polyamide could be increased by dispersing in the polyamide about 1 percent to about 10 percent of a compound represented by the formula:

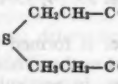


wherein R and R' are independently at each occurrence hydrogen, methyl or ethyl and *r*, *s*, and *t* are integers from 31 to about 200.

However, with incorporation of this antistatic additive in the polyamide, serious problems have been encountered in melt-spinning due to the frequent occurrence of "nubs" or enlarged places in the extruded polyamide filament. It has now been found that the occurrence of said nubs in the antistatic polyamide fiber can be greatly reduced by dispersing in the polymer at least 0.5% by weight, based on the weight of the antistatic agent, of a phenol compound represented by the formula:



where R_1 is hydrogen or an alkyl radical containing 1 to 5 carbon atoms, R_2 is an alkyl radical containing 12 to 18 carbon atoms, and R_3 is an alkyl radical containing 12 to 18 carbon atoms; and at least 0.5% by weight, based on the weight of the antistatic additive, of a sulfur compound of the formula.



where R_4 is an alkyl radical containing 8 to 18 carbon atoms and R_5 is an alkyl radical containing 8 to 18 carbon atoms.

3,728,306

COMPOSITION COMPRISING AN EPOXY RESIN WITH AN ORGANOSTANNOIC ACID-CARBOXYLIC ACID ANHYDRIDE REACTION PRODUCT

Mark Markovitz and Leo S. Kohn, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 757,156, Sept. 3, 1968. This application July 27, 1971, Ser. No. 166,612

Int. Cl. C08g *30/12*

U.S. Cl. 260—47 EC 1 Claim

Epoxy resins cured with organostannoic acid-carboxylic acid anhydride reaction products provide rapid low-temperature curing of epoxy resins which are characterized by good electrical and physical properties including corona resistance.

3,728,307

METHOD OF PREPARING HARDENABLE PLASTICS COMPRISING CONDENSING MIXED ARYL BORATES WITH HCHO

Franz Josef Huster, Drachenfelsstr. 5, Troisdorf, Germany

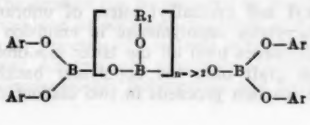
No Drawing. Continuation-in-part of applications Ser. No. 519,805, Nov. 2, 1965, and Ser. No. 852,151, Aug. 13, 1969, both now abandoned. This application Oct. 27, 1971, Ser. No. 192,934

Claims priority, application Germany, Nov. 3, 1964, D 45,766

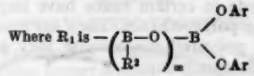
Int. Cl. C08g *5/06, 33/18*

U.S. Cl. 260—51 R 3 Claims

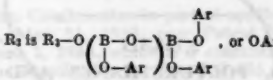
Novel mixed aryl borates of the general formula $BO_x(OAr)_y$, wherein Ar is an aryl radical, *x* is greater than 1 but less than 1.5 and *y* is greater than 0 and less than 1, which mixture contains branched chain aryl borates of the formula:



Where R_1 is



R_2 is R_1—O



, or OAr,

R_3 is R_1 or Ar and m is =>1.

which mixed aryl borates are made by reacting a phenolic compound with boric acid or boric oxide with an excess of boron at elevated temperatures and for extended periods of time sufficient to condense the boron compound and the phenolic compound and cause water as well as phenolic compound to be condensed out of the reaction and removed therefrom. These mixed aryl borates are reactable to produce a preproduct which is then reacted with trioxane and, if desired, a solid formaldehyde yielding materials to form thermosetting resins of the phenol-aldehyde type containing boron thereon.

3,728,308

CATALYST FOR URETHANE REACTION

Ronald D. Allison and Louis G. Rey, Sarnia, Ontario, Canada, and Roy E. Morgan, Jr., Richwood, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 18, 1971, Ser. No. 116,628

Int. Cl. C08g *22/40*

U.S. Cl. 260—77.5 AB 4 Claims

The reaction of an organic polyisocyanate with a polyol to produce a polyurethane is catalyzed by an alkali metal salt of the polyol. Both the polyol and the catalyst should be substantially anhydrous.

3,728,309

PROGRESSIVE HEATING IN POLYESTER CONDENSATIONS

Emil J. Maxion, North Brunswick, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed June 13, 1969, Ser. No. 833,155

Int. Cl. C08g *17/01*

U.S. Cl. 260—75 M 10 Claims

Unusually high reaction temperatures may be employed in the solid state polycondensation of crystalline linear polyester prepolymers or resins (e.g., polyethylene terephthalate) having a reduced specific viscosity of 0.2 or more by maintaining the polycondensation temperature initially (e.g., at 200–230° C.) between the sticking temperature of the resin in the amorphous state and in the initial crystalline state until the resin sticking temperature has substantially further increased as the reaction progresses, and thereafter elevating the polycondensation temperature either stepwise or gradually to a level (e.g., 240° C. or more) substantially above the initial crystalline sticking temperature in producing resins of higher molecular weight without significant agglomeration; the reaction rates are generally faster and higher molecular weights are obtainable than heretofore.

3,728,310

MIXED POLYAMINES FORMED BY THE ACID-CATALYZED CONDENSATION OF 3-CHLOROANILINE, 2,5-DICHLOROANILINE, AND FORMALDEHYDE AS CURING AGENTS FOR POLYURETHANES

Norman K. Sundholm, Middlebury, and Ivan Mankowich, Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,237

Int. Cl. C08g *22/16*

U.S. Cl. 260—75 NH 2 Claims

The mixtures of polyamines formed by the acid-catalyzed condensation of 3-chloroaniline, 2,5-dichloroaniline,

and formaldehyde in certain ratios have improved properties for curing polyurethanes. They are readily blended with the liquid polyurethane because they are liquid or have low solidification points.

3,728,311

POLYUREAS, POLYURETHANES AND POLYAMIDES BASED ON A TETRA-OXO DIAMINE COMPONENT

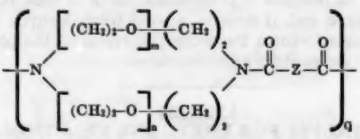
Chung Ho Park, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,931

Int. Cl. C08g *20/02, 22/02, 22/16*

U.S. Cl. 260—77.5 C **16 Claims**

Disclosed herein are polymers of the structure



wherein:

m and *n*, alike or different, are 1 to 5,
q is 25 to 1000; and
Z is selected from:

- divalent hydrocarbon groups containing from 2 to 20 carbon atoms,
- hydrocarbondioxy groups, —O—Z'—O—, containing from 2 to 20 carbon atoms, and
- hydrocarbondiamino groups, —NH—Z'—NH—, containing from 2 to 20 carbon atoms; said Z and Z' groups being composed of divalent aliphatic groups, arylene groups or combinations thereof.

3,728,312

MOLTEN PRODUCTION OF POLYAMIDES FROM TEREPHTHALIC ACID DIALKYL ESTER AND TRIMETHYL HEXAMETHYLENE DIAMINE UNDER REDUCED PRESSURE

Johannes Schneider and Wolfgang Pungs, Troisdorf, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

No Drawing. Filed Sept. 18, 1970, Ser. No. 73,675

Claims priority, application Germany, Sept. 18, 1969, P 19 47 217.4

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **4 Claims**

In the production of polyamides by pre-condensing polyamide-forming reactants in the presence of water, removing water, and then polycondensing to form the polyamide, the improvement which comprises terminating the polycondensation when the viscosity of the product falls in the range of about 50 to 90, transferring the material at a temperature of about 200 to 300° C. to a screw extruder having a vacuum outlet, and advancing said material through the screw extruder while continuing polycondensation to a final viscosity of about 116 to 150. Advantageously the polyamide when polycondensation is terminated at a viscosity of 50 to 90 is sent to a feeder bin under pressure of an inert gas and from there is discharged into the screw extruder.

The resulting polyamides, though quite hard, are low melting and thus light stabilizers can be blended therein and the easier working will not degrade the stabilizers, so transparent hollow articles of improved appearance can be made by injection molding.

3,728,313

ARYLENE SULFIDE POLYMER COATING COMPOSITION

Harold Wayne Hill, Jr., and James E. Edmonds, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Original application July 25, 1969, Ser. No. 845,098. Divided and this application Oct. 12, 1971, Ser. No. 188,492

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **8 Claims**

Adherent coatings of arylene sulfide polymers are formed by applying a mixture of the polymer and an oxide or sulfide of cobalt or molybdenum to a solid substrate such as iron, steel, aluminum and ceramic.

3,728,314

CHEMICAL COMPOSITION FOR VISCOSITY CONTROL AND FILM FORMING MATERIALS

Izhak Blank, Haifa, Israel, assignor to Hydrophilics International, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 36,931, May 13, 1970. This application May 3, 1971, Ser. No. 139,544

Int. Cl. C08f *15/14, 15/18*

U.S. Cl. 260—80.8 **7 Claims**

A hydrophilic copolymer is formed through the bulk copolymerization of methyl methacrylate, an acrylic acid, and an acrylate plasticizer, in particular amounts, followed by treatment of the formed copolymer, in powder form, with an aqueous, basic material, such as ammonium hydroxide.

3,728,315

COPOLYMERIZED HARD PLASTIC HYDROGEL COMPOSITIONS

Robert Gustafson, 5129 N. St. Louis Ave., Chicago, Ill. 60625

No Drawing. Filed Aug. 3, 1971, Ser. No. 168,769

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.75 **7 Claims**

A shape-retaining cross-linked polymer formed from monomers including from about 20% to about 35% by weight of the copolymer of an alkylene glycol methacrylate, said alkylene having from one to three carbon atoms, from about 5% to about 35% by weight of the copolymer of a hydroxy alkyl methacrylate, said alkyl having from one to three carbon atoms, and from about 55% to about 70% by weight of the copolymer of a compound being a member selected from the group consisting of ethyl methacrylate and n-butyl methacrylate and a contact lens formed therefrom.

3,728,316

CHLORO-1,3-BUTADIENE/α-ALKYL ACRYLATE ESTER-GRAFTED COPOLYMERS

Donald Max Simons, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 836,376, June 25, 1969. This application Nov. 16, 1970, Ser. No. 90,112

Int. Cl. C08f *15/26*

U.S. Cl. 260—80.77 **14 Claims**

Lower alkyl and cycloalkyl esters of unbranched α-C_1–C_4 alkylacrylates copolymerize in emulsion with 2-chloro-1,3-butadienes until all the latter monomer is exhausted, then graft onto the copolymer backbone soformed. The reaction proceeds in two distinct steps, the

grafting step requiring the presence of a polymerization catalyst, an anionic surfactant, and at least one cation of the group: triethanolammonium, tri(2-propanol)ammonium, diethanol-ammonium, and C_1–C_3 alkyldiethanol-ammonium. Novel grafted copolymers of 2-chloro-1,3-butadienes produced by this process range from rubbery to plastic materials. Grafted copolymers of 2-chloro-1,3-butadienes with methyl methacrylate are excellent adhesives for plasticized polyvinyl chloride.

3,728,317

OPTICAL CONTACT LENSES AND RELATED DEVICES

Izhak Blank, Haifa, Israel, assignor to Hydrophilics International, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 36,931, May 13, 1970. This application May 3, 1971, Ser. No. 139,545

Int. Cl. C08f *15/14, 15/18*
U.S. Cl. 260—86.1 R **5 Claims**

A copolymer having hydrophilic surfaces is formed through the bulk copolymerization of methyl methacrylate and acrylic acid, in particular ranges, followed by a treatment of the formed copolymer with a mild, basic material, such as ammonium hydroxide, in order to neutralize the acid groups present. The depth of penetration of the basic material determines the degree to which the material is hydrophilic.

3,728,318

SUSPENSION POLYMERIZATION OF UNIFORM POLYMER BEADS

Herman C. Hamann, Melrose Park, and David H. Clemens, Willow Grove, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 4, 1971, Ser. No. 121,130

Int. Cl. C08f *1/11, 15/02, 15/04*
U.S. Cl. 260—86.7 **6 Claims**

Uniform polymer beads are produced by a suspension polymerization technique with the aid of a cationic dispersing or suspending agent in combination with a protective colloid, the polymerization being carried out with a basic pH. Polymer or copolymer beads which are uniformly sized and which represents a relatively narrow "cut" or range of a standard sieve classification are produced.

3,728,319

REACTION PRODUCTS OF POLY N-VINYLPYRROLIDONE OR POLY N-VINYLPYRROLIDONES WITH ALKYL SIDE CHAINS AND ORGANIC SECONDARY OR TERTIARY AMINES

Robert J. Kiesel, Chester, N.J., David I. Randall, Easton, and Nathan D. Field, Allentown, Pa., and Stanley Rudoff, Elizabeth, N.J., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Feb. 19, 1970, Ser. No. 12,867

Int. Cl. C08f *7/12, 27/00*
U.S. Cl. 260—88.1 R **8 Claims**

Amino-alkylated heterocyclic N-vinyl polymers are disclosed. The polymers are the reaction product of polyvinyl pyrrolidone, alkylated polyvinyl pyrrolidone, or N-vinylpyrrolidone with a saturated secondary or tertiary amine. The product can be prepared by reacting the polyvinylpyrrolidone or alkylated polyvinyl pyrrolidone with amine in the presence of a suitable solvent and a free radical initiator. Alternatively, monomeric N-vinylpyrrolidone can be simultaneously polymerized and amino-alkylated.

3,728,320

POLYMERIC EPOXIDES

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 812,079, May 11, 1959, now Patent No. 3,135,705, dated June 2, 1964, which is a continuation-in-part of abandoned application Ser. No. 738,626, May 29, 1958. This application June 30, 1960, Ser. No. 39,809

Int. Cl. C08f *7/12*
U.S. Cl. 260—88.3 A **13 Claims**

High molecular weight, water-insoluble copolymers of propylene oxide and higher alkylene oxides with a monoepoxide of a diene or polyene and particularly with butadiene monoxide, vinyl cyclohexene monoxide, and 1,2-epoxy-5,9-cyclododecadiene are described.

3,728,321

POLYMERIC EPOXIDES

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 812,079, May 11, 1959, now Patent No. 3,135,705, dated June 2, 1964, which is a continuation-in-part of abandoned application Ser. No. 738,626, May 29, 1958. This application June 30, 1960, Ser. No. 39,811

Int. Cl. C08f *7/12*
U.S. Cl. 260—88.3 A **10 Claims**

High molecular weight, water-insoluble copolymers of propylene oxide and higher alkylene oxides with an ethylenically unsaturated glycidyl ether and particularly with allyl glycidyl ether are described.

3,728,322

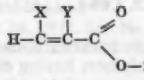
LIGHT SENSITIVE ESTERS OF POLYVINYL ALCOHOL

Harlan B. Freyermuth, Easton, and Nathan D. Field, Allentown, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Jan. 14, 1970, Ser. No. 2,941

Int. Cl. C08f *27/12*
U.S. Cl. 260—91.3 VA **4 Claims**

A light sensitive film-forming polymer having the general formula



wherein X is selected from the group consisting of halogen, lower alkoxy, phenoxy, heterooxy, C-heterocyclic or polycyclic aryl moieties, Y represents hydrogen, halogen, cycloalkyl or lower alkyl and Z represents the residue of a polyvinyl alcohol which may be partially or completely esterified.

3,728,323

PROCESS FOR THE POLYMERIZATION OF CONJUGATED DIENES

Tai Chun Cheng, Mogadore, and Adel F. Halasa, Bath, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 854,289, Aug. 29, 1969. This application Sept. 7, 1971, Ser. No. 178,489

Int. Cl. C08d *3/04, 3/06, 1/32*
U.S. Cl. 260—94.2 T **15 Claims**

Conjugated dienes are polymerized by a new catalyst system which permits control of the molecular weight

and gives a more easily processed product. This catalyst system comprises (1) a potassium hydrocarbon compound having 1–10 carbon atoms in which the hydrocarbon portion is a primary, secondary or tertiary alkyl or an aryl radical, and (2) a potassium alkoxide of 4–10 carbon atoms, preferably a tertiary-alkoxide. The diene polymers produced by this process have controllable molecular weights in the range of 25,000 to 1,000,000 preferably 100,000 to 500,000, broad molecular weight distribution, glass transition temperatures higher than normally obtained, high degree of branching and are more easily processed in the production of rubber and other compositions for commercial use.

3,728,324

PROCESS FOR THE POLYMERIZATION OF CONJUGATED DIENES

Tai Chun Cheng, Mogadore, and Adel F. Halasa, Bath, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 854,274, Aug. 29, 1969. This application Sept. 7, 1971, Ser. No. 178,492

Int. Cl. C08d *1/20, 3/04, 3/06*

U.S. Cl. 260—94.2 T **15 Claims**

Conjugated dienes are polymerized by a new catalyst system which permits control of the molecular weight and gives a more easily processed product. This catalyst system comprises (1) a potassium hydrocarbon compound having 1–10 carbon atoms in which the hydrocarbon portion is a primary, secondary or tertiary alkyl radical, and (2) a sodium tertiary-alkoxide of 4–10 carbon atoms. The diene polymers produced by this process have controllable molecular weights in the range of 25,000 to 1,000,000, preferably 100,000 to 500,000, broad molecular weight distribution, glass transition temperatures higher than normally obtained, high degree of branching and are more easily processed in the production of rubber and other compositions for commercial use.

3,728,325

POLYMERIZATION OF CONJUGATED POLYOLEFINS

Carl J. Carlson and Samuel E. Horne, Jr., Akron, Ohio, assignors to The B. F. Goodrich Company

No Drawing. Filed Apr. 21, 1955, Ser. No. 503,027

Int. Cl. C08d *1/14, 3/12*

U.S. Cl. 260—94.3 **3 Claims**

Conjugated polyolefin hydrocarbons are polymerized to rubbery or resinous polymers having essentially an all 1,4 structure with catalysts containing titanium compounds. The cis- and trans-1,4-ratios can be varied by adjustment of the titanium to aluminum ratio of the catalyst.

3,728,326

HYPOCALCEMIC PEPTIDE AND PROCESS OF PREPARING IT USING A TWO-PHASE N-BUTANOL-PYRIDINE-ACETIC ACID-AMMONIUM ACETATE-WATER SYSTEM

Irving Putter, Martinsville, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation of abandoned application Ser. No. 653,342, July 14, 1967. This application July 2, 1971, Ser. No. 159,559

Int. Cl. C07c *103/52;* **C07g** *7/10*

U.S. Cl. 260—112 T **11 Claims**

This invention relates to a hypocalcemic peptide derived from thyroid gland, in pure form and defined composition. In accordance with the invention, the peptide is prepared by counter-current extraction of thyroid gland extract with a two-phase n-butanol-pyridine-acetic acid-water-ammonium acetate system. Further purification is effected by counter-current extraction with a two-phase n-butanol-water-acetic acid system. The invention also provides a process for treating thyroid glands using a two-phase n-butanol-pyridine-acetic acid-water-ammonium acetate system to produce thyroid gland extract suitable for use in said counter-current extractions.

3,728,327

PROTEIN AND METHOD OF EXTRACTING SAME FROM SOYBEANS EMPLOYING REVERSE OSMOSIS

Dean Russell Frazeur and Robert Bruce Huston, Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

No Drawing. Continuation-in-part of application Ser. No. 43,981, June 5, 1970. This application Apr. 10, 1972, Ser. No. 242,677

Int. Cl. A23j *1/14*

U.S. Cl. 260—123.5 **2 Claims**

An aqueous homogenized slurry of soybean particles is subjected to a separation so as to separate insoluble materials from liquid and the liquid is subjected to reverse osmosis to obtain as a retentate soy proteins including both those which are insoluble and soluble in water at the protein isoelectric point.

3,728,328

COBALT COMPLEXES OF AN AZO COMPOUND AND A TRIDENTAIE ORGANIC LIGAND

Paul Lienhard, Riehen, Fabio Beffa, Basel, and Charles Soiron, Riehen, Switzerland, assignors to J. R. Geigy A.G., Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 496,651, Oct. 15, 1965. This application Mar. 11, 1968, Ser. No. 711,887

Claims priority, application Switzerland, Oct. 20, 1964, 13,579/64

Int. Cl. C09b *45/10, 45/20, 45/30*

U.S. Cl. 260—147 **10 Claims**

Complex azo dyestuff-cobalt compounds consisting essentially of, per molecule:

a cobalt atom:

one molecule of a colorless tridentate organic ligand which is coordinatively bound to said cobalt atom by way of three nitrogen atoms and which is free from ionogenic groups which do not partake in complex formation, each of said nitrogen atoms participating in the formation of a five- to six-membered ring of which said cobalt atom is a member; and

one radical of an azo dyestuff, bicyclically bound to the cobalt atom and being free from groups which are capable of dissociating acid in water but do not partake in complex formation, whereby the thus constituted complex is rendered cationic;

and one equivalent of a colorless anion, are disclosed; they are useful for coloring organic polymeric materials and especially for dyeing acrylic fibers from an aqueous bath.

3,728,329

PROCESS FOR PRODUCING PEARL ESSENCES

Nobumitsu Yano, Saitama-ken, Masao Fukushima, Tokyo, Masanori Kishi, Omiya-shi, and Fumio Nagayoshi, Saitama-ken, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Jan. 15, 1970, Ser. No. 3,245

Int. Cl. C07d *51/52, 51/54*

U.S. Cl. 260—211.5 R **6 Claims**

By crystallizing at least one compound selected from nucleic acids and their relative nucleic compounds from

an aqueous solution thereof in the presence of at least one ionic surface active agent in the solution, there are obtained pearl essences of crystals having smooth surfaces, uniform size and shape, a long diameter of 3–100 microns, a short diameter of 1–40 microns and a thickness of 0.03–3 microns, in a high yield. The pearl luster of the thus obtained pearl essences is strong, and these pearl essences are rich in resistance to chemicals, heat and light. The ionic surface active agents used are cationic, anionic or amphoteric, and are preferably used in a proportion of 1–0.001% by weight of the aqueous solution.

3,728,330

PROCESS FOR MANUFACTURING CELLULOSE XANTHATE AND VISCOSE PREPARED FROM SAID CELLULOSE XANTHATE

Hannes Sihtola, Tiilimaki 30A, Helsinki 33, Finland, and Boris Nizovsky, Gyldenintie 14A, Helsinki 20, Finland

No Drawing. Continuation-in-part of application Ser. No. 825,390, May 16, 1969. This application June 2, 1971, Ser. No. 149,370

The portion of the term of the patent subsequent to Aug. 17, 1988, has been disclaimed

Int. Cl. C08b *9/00, 21/20*

U.S. Cl. 260—217 **25 Claims**

Viscose manufacturing process. Aged alkali cellulose containing 20–36 wt. percent cellulose and more than 14 wt. percent NaOH is re-steeped with a sodium hydroxide solution containing less than 15% by weight NaOH and pressed to reduce the amount of NaOH in the alkali cellulose, yielding a second alkali cellulose containing less than 14% by weight NaOH and at least 24% by weight cellulose based on the total weight of said second alkali cellulose. The second alkali cellulose is xanthated with carbon disulfide. The amount of carbon disulfide required for xanthation based on the total weight of the cellulose in the alkali cellulose is very low and for rayon staple and cellophane may be as low as 14–24% due to the low amount of sodium hydroxide and the high amount of cellulose present in the alkali cellulose.

The xanthate is thereafter dissolved in dilute sodium hydroxide or water to yield viscose.

3,728,331

PROCESS FOR REDUCING THE VISCOSITY OF A CELLULOSE ETHER WITH HYDROGEN PEROXIDE

Albert B. Savage, Midland, Mich., assignor to the Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 4, 1969, Ser. No. 813,720

Int. Cl. C08b *11/00*

U.S. Cl. 260—231 R **10 Claims**

A controlled reduction of the viscosity of a cellulose ether is achieved by blending an essentially dry, free-flowing particulate cellulose ether with a predetermined amount of hydrogen peroxide, heating the blended cellulose ether at about 50°–150° C. to react substantially all the added hydrogen peroxide, and recovering a lower viscosity, particulate cellulose ether having an intrinsic fluidity greater than the initial cellulose ether. High yields and a readily controlled viscosity reduction are obtained.

3,728,332

PREPARATION OF STARCH ESTERS

Martin M. Tessler, Edison, and Morton W. Rutenberg, North Plainfield, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 3, 1971, Ser. No. 177,777

Int. Cl. C08b *19/04*

U.S. Cl. 260—233.5 **7 Claims**

Starch dispersions in aqueous or non-aqueous media are reacted with acyl guanidines to produce starch esters.

3,728,333

METHOD OF OBTAINING MONOHYDRATE OF SODIUM SALT OF 6 - (3 - PHENYL-5-METHYL-ISOXAZOLE - 4 - CARBAMINO)-PENICILLANIC ACID

Marina Alexeevna Panina, ulitsa Gorkogo 4, kv. 59, Moscow, U.S.S.R.; Gersh Izrailevich Kleiner, Moskovskaya ulitsa 57, kv. 15, Riga ,U.S.S.R.; Ivan Timofeevich Strukov, Balaklavsky prospekt 20, korpus 3, kv. 209; and Alexandra Fedorovna Zdobnova, Sevastopolsky prospekt 38, kv. 24, both of Moscow, U.S.S.R.; Maria Kuzminichna Andreeva, ulitsa Strautu 62, kv. 1, Riga, U.S.S.R.; and Nonna Mikhailovna Ryabova, Varshavskoe shosse 69, korpus 1, kv. 140, Moscow, U.S.S.R.

No Drawing. Filed Nov. 4, 1970, Ser. No. 86,990

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **3 Claims**

A method of obtaining a monohydrate of sodium salt of 6 - (3 - phenyl-5-methylisoxazole-4-carbamine)-penicillanic acid consisting in that 6-aminopenicillanic acid is made to interact with acid chloride of 3-phenyl-5-methylisoxazole-4-carboxylic acid in an aqueous-acetone medium in the presence of sodium bicarbonate at pH=7–8, then 6-(3-phenyl - 5 - methylisoxazole - 4 - carbamino)-penicillanic acid is extracted from the reaction mass, for example, with butylacetate while being acidified to pH=1–3, then the obtained extract is treated with an equimolecular amount of sodium salt of acetic acid and the desired product is separated.

3,728,334

6 - (1 - CARBOXYCYCLOALKYLCARBOXAMIDO) PENICILLANIC ACID, DERIVATIVES AND SALTS THEREOF

Kenneth Butler, Old Lyme, Ronnie D. Carroll, East Lyme, and Ernest S. Hamanaka, Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed Mar. 3, 1971, Ser. No. 120,762

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 **24 Claims**

A novel class of broad spectrum antibiotics derived from 6 - (1 - carboxycycloalkylcarboxamido) penicillanic acids and derivatives and salts thereof.

3,728,335

METHODS OF PREPARING 21-FLUORO-16,17-ALKYLIDENEDIOXY-3,20-DIKETO-PREGNANES

Francisco S. Alvarez, Sunnyvale, Calif., assignor to Syntex Corporation, Panama, Panama

Filed May 26, 1971, Ser. No. 147,218

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 D **23 Claims**

A fluorination method for preparing 21-fluoro-pregnanes and also methods of preparing 9α,11β-dichloro-6α,21-difluoro-16α,17α-alkylidenedioxy-pregna-1,4-diene-3,20-dione and 9α,11β-dichloro-6α,21-difluoro-16α,17α-alkylidenedioxy-pregn-4-ene-3,20-dione derivatives from the corresponding 21-acyloxy-6α-fluoro-16α,17α-alkylidenedioxy-3,20-diketo-pregnane derivatives. The fluorination process comprises (1) displacement of the corresponding 21-mesyloxy, or 21-tosyloxy, pregnane derivative with bromide ion to yield the corresponding 21-bromo pregnane derivative, and (2) displacement with fluoride ion to effect replacement of the 21-bromo thereby yielding the corresponding 21-fluoro pregnane derivative. A salient feature is the use of a sulfone solvent in the fluoride displacement step, thereby affording improved yields and purer products. The process of preparing 9α,11β-dichloro-6α,21-difluoro-16α,17α-alkylidenedioxy-3,20-keto-pregna-1,4-diene or -pregn-4-ene derivatives comprises treating the corresponding 21-bromo-6α-fluoro-16α,17α-alkylidenedioxy-3,20-dione-pregnane derivatives according to the aforementioned displacement process in combination with a subsequent 9α,11β-chlorination process. The aforementioned processes are characterized by high yields and high purity products.

3,728,336
(LOWER)ALKOXYTETRAHYDROPYRANYL ETHERS AND 5',6'-DIHYDRO-2H-PYRAN-4'YL ETHERS OF 7β-METHYL-Δ⁴-ANDROSTANES

Alexander D. Cross, San Francisco, and John A. Edwards, Los Altos, Calif., assignors to Syntex Corporation, Panama, Republic of Panama

No Drawing. Continuation-in-part of applications Ser. No. 731,300, May 22, 1968, and Ser. No. 766,321, Oct. 9, 1968. This application May 11, 1970, Ser. No. 36,457
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 R 12 Claims

The 4'-(lower)alkoxytetrahydropyran-4'-yl ethers and 5',6'-dihydro-2H-pyran-4'-yl ethers of 7β-methyl-Δ⁴-androstanes have high oral anabolic activities.

3,728,337
PREPARATION OF 9α-FLUORO-11-OXO-STEROIDS

Derek Harold Richard Barton, London, England, assignor to Research Institute for Medicine and Chemistry Inc.

No Drawing. Filed June 9, 1971, Ser. No. 150,842
Claims priority, application Great Britain, June 17, 1970, 29,437/70
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D 11 Claims

9α-fluoro-11-oxo steroids can conveniently be prepared by enolisation of an 11-oxo steroid with a substituted alkali metal amide and subsequent fluorination of the enolate by reaction with perchloryl fluoride. The invention is particularly applicable to 3-oxygenated - 11 - oxo steroids, although it is necessary to protect any 3-oxo groups.

3,728,338
6-ALKYL - 3 - HYDROCARBONACEOUS-16α,17α-DIHYDROXYPREGNA - 3,5 - DIEN - 20-ONE CYCLIC 16,17-ACETALS AND CONGENERS

Charles S. Markos, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Apr. 18, 1972, Ser. No. 245,253
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D 10 Claims

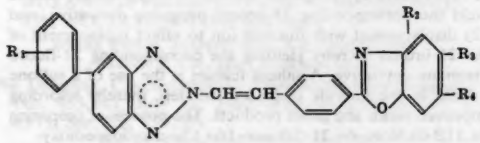
Preparation of 6-alkyl-3-hydrocarbonaceous-16α,17α-dihydroxypregna-3,5-dien-20-one cyclic 16,17-acetals and 3-thienyl analogs thereof, together with their valuable anti-inflammatory properties, is disclosed.

3,728,339
STYRYL COMPOUNDS

Klaus-Dieter Bode and Josef Schroeder, Leverkusen, and Carl-Wolfgang Schellhammer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 22, 1970, Ser. No. 83,237
Claims priority, application Germany, Nov. 3, 1969, P 19 55 066.4
Int. Cl. C09b *23/14*
U.S. Cl. 260—240 D 6 Claims

Styryl compounds of the formula



in which

R_1 represents hydrogen, halogen, alkyl, alkenyl, alkoxy or aryl radicals, and

R_2, R_3 and R_4 denote hydrogen, halogen, alkyl, alkoxy, cycloalkyl, aralkyl or aryl radicals or the nitrile group, and

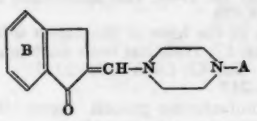
R_2 and R_3 can conjointly form a six-membered aromatic ring, as well as their preparation and their use as optical brightening.

3,728,340
PIPERAZINE DERIVATIVES AND PROCESSES FOR THEIR MANUFACTURE

Thomas Raabe, Heusenstamm; Steffen Piesch, Oberursel; Klaus Resag, and Rolf-Eberhard Nitz, both of Frankfurt (Main)-Fechenheim, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt Main, Germany

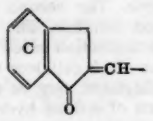
Filed April 27, 1971, Ser. No. 137,997
Claims priority, application Germany, April 30, 1970, P 20 21 262.8
Int. Cl. C07d *51/72*
U.S. Cl. 260—240 R 4 Claims

The present invention relates to new, pharmacologically valuable piperazine derivatives of the general formula



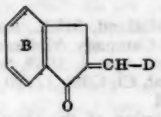
wherein

A means an alkyl or hydroxyalkyl radical having from one to four carbon atoms in the alkyl moieties, a benzhydryl or phenyl radical or one of the groups -COOR or



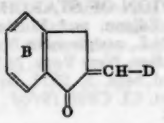
R representing alkyl having from one to four carbon atoms and the benzene rings B and/or C may be substituted by halogen

and to the production of such derivatives by reacting a compound of the general formula



wherein D stands for ONa, OK, OH, Cl or Br with a piperazine compound of the general formula

wherein A has the meaning given above, or by reacting, at a molar ratio of 2:1, a compound of the general formula



wherein D means ONa, OK, OH, Cl or Br with piperazine.

3,728,341
PROCESS FOR THE PURIFICATION OF CEPHALEXIN

Harold A. Crisp, Harrow Weald, John F. Oughton, Gerrards Cross, and Graham A. Pearce, Woodnesborough, near Sandwich, England, assignors to Glaxo Laboratories Limited, Middlesex, England

No Drawing. Filed July 20, 1970, Ser. No. 56,261
Claims priority, application Great Britain, July 25, 1969, 37,491/69
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C 1 Claim

A new crystalline form of cephalexin i.e. the γ-form. A process for the manufacture of cephalexin having this form comprises contacting cephalexin having the β-crystalline form with methanol. The β-crystalline form in highly pure pharmaceutical grade can be obtained by contacting the so-produced α-cephalexin with an aqueous medium.

3,728,342
3-ACYLOXYMETHYL CEPHALOSPORINS AND METHOD OF PREPARATION

Stjepan Kukolja, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Dec. 3, 1970, Ser. No. 94,988
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C 9 Claims

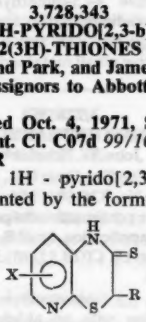
3-cycloalkylcarbonyloxymethyl and 3-cycloalkylalkanoyloxymethyl Δ^3-cephalosporins [e.g., 7-(2'-thienylacetamido)-3-cyclobutylcarbonyloxymethyl - Δ^3 - cephem-4-carboxylic acid], are prepared by reaction of a 7-acylamido-Δ^2-desacetylcephalosporin with the anhydride of an aliphatic carboxylic acid to form the corresponding Δ^2-acyloxymethyl cephalosporin which can be oxidized and reduced to form the corresponding Δ^3-compound.

3,728,343
SUBSTITUTED 1H-PYRIDO[2,3-b][1,4]THIAZINE-2(3H)-THIONES

Kao Hwang, Highland Park, and James Daniel Ratajczyk, Waukegan, Ill., assignors to Abbott Laboratories, Chicago, Ill.

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,502
Int. Cl. C07d *99/10*
U.S. Cl. 260—243 R 2 Claims

Novel substituted 1H - pyrido[2,3-b][1,4]thiazines - 2 (3H)-thiones represented by the formula



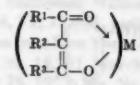
wherein X is hydrogen, hydroxy, mercapto, lower alkyl, lower alkoxy or halo and R is hydrogen, hydroxy, lower alkyl, lower alkoxy or halo. The compounds exhibit anti-inflammatory and anti-secretory activity.

3,728,344
PROCESS FOR PREPARING TRIAZINES AND CROSSLINKED POLYMERS OF COPOLYMERS

William E. Emerson, and Edwin Dorfman, both of Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 634,877, May 1, 1967, abandoned. This application May 22, 1970, Ser. No. 38,651
Int. Cl. C07d *55/50*
U.S. Cl. 260—248 CS 9 Claims

This invention (A) relates to a process for producing at preferably low reaction temperatures, a triazine at high levels of conversion and yield from a haloalkane nitrile such as perfluoroalkane nitrile by the novel employment of a catalytic amount of a member selected from the group consisting of (1) an organic amine oxide, (2) an organic amine oxide hydrochloride of said organic amine oxide, and mixtures thereof, and (3) an organometallic catalyst selected from the group consisting of (a) an organometallic compound containing at least one metal-to-carbon bond in which said metal is selected from the group consisting of metals of the Periodic Table Groups IIIB, IVB, VB, VIB, VIIB, VIII, IB, IIB, a group VA metal having an atomic weight of at least about 30, and a Group IVA metal, and (b) a metal or metalloxy beta-ketoenolate of the formula:



in which n is an integer equal to the valence of the metal or metalloxy ion, and in which each of R^1, R^2, and R^3 is selected from the group consisting of hydrogen and an organic substituent, and in which R^2 additionally includes halogen, nitro or sulfo, and also (B) relates to the novel employment of the above described catalyst in a catalytic amount employed with a polymer or copolymer containing at least greater than an average of one cyanohaloalkyl group per molecule of the polymer or copolymer, to form a cross-linked polymer or copolymer.

3,728,345
PREPARATION OF QUINOXALINE-2-CARBOXAMIDE DERIVATIVES

Timothy Henry Cronin, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed March 19, 1971, Ser. No. 126,342
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 R 5 Claims

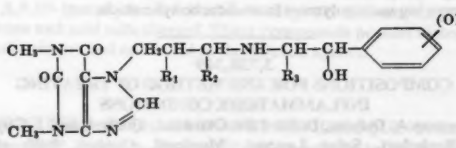
Process for the preparation of N-(hydroxyalkyl)-2-quinoxalinecarboxamide-1,4-dioxides through treatment of 2-quinoxalinecarboxylic acid, aminoalkyl ester, 1,4-dioxide acid addition salts with a base in a reaction-inert solvent at 10°–60° C. and pH of 7–14.

3,728,346
HYDROXYPHENYLHYDROXYALKYLAMINOALKYLTHEOPHYLLINES

Karl Heinz Klingler, Langen, Germany, assignor to Deutsche Gold-und Silber-Scheideanstaet vormals Roessler, Frankfurt am Main, Germany

Filed July 16, 1971, Ser. No. 163,468
Int. Cl. C07d *57/48*, *57/52*
U.S. Cl. 260—256 10 Claims

Compounds are prepared having the formula



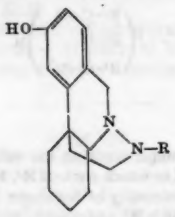
Where R_1 and R_2 are alkyl of one to four carbon atoms or one of them is hydrogen, R_3 is hydrogen or alkyl of one to two and n is 1 or 2 or a salt thereof. The compounds have outstanding broncholytic activity.

3,728,347
AZAMORPHINAN COMPOUNDS

Kazuo Kigasawa, Kawasaki; Mineharu Hiiragi, and Nagatoshi Wagatsuma, both of Tokyo, all of Japan, assignors to Tokeda Chemical Industries, Ltd., Osaka, Japan

Filed April 3, 1970, Ser. No. 25,530
Claims priority, application Japan, April 3, 1969, 44/25204
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 A 8 Claims

Azamorphinan compounds of the formula



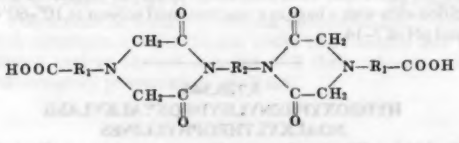
wherein R is an aralkyl group, a lower alkenyl group or a lower cycloalkylalkyl group, and pharmaceutically acceptable salts thereof, have useful analgesic activity and do not invite drug dependence.

3,728,348
DICARBOXYLIC ACIDS CONTAINING DIKETOPIPERAZINE GROUPS AND POLYMERS PREPARED THEREFROM

Lester T. C. Lee, Parsippany; Eli M. Pearce, Somerville, both of N.J., and Morton H. Litt, University Heights, Ohio, assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 21, 1970, Ser. No. 39,510
Int. Cl. C07d *51/72*
U.S. Cl. 260—268 DK 11 Claims

Dicarboxylic acids having the formula



wherein R_1 represents a phenylene or alkylene radical and R_2 represents a divalent organic radical, are prepared by reacting a tricarboxylic acid having the formula $HOOCR_1N(CH_2COOH)_2$, such as nitrilotriacetic acid, with a diamine having the formula $H_2NR_2NH_2$, such as hexamethylene diamine, in a substantially 2:1 molar ratio in the presence of an inert solvent. The dicarboxylic acids are useful as monomers in preparing linear film and fiber-forming polyamides and polyesters in accordance with conventional methods for preparing such polymers from dicarboxylic acids.

3,728,349
COMPOSITIONS FOR AND METHOD OF TREATING INFLAMMATORY CONDITIONS

Thomas A. Dobson, Dollard des Ormeaux, Quebec, and J. Guy Rochefort, Saint Laurent, Montreal, Quebec, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed June 26, 1970, Ser. No. 50,296
Claims priority, application Canada, Aug. 7, 1969, 058,988
Int. Cl. A61k *27/00*
U.S. Cl. 424—285 6 Claims

Compositions for oral or parenteral administration containing, as the active ingredient, γ-oxo-2-dibenzofuranbutyric acid or its water-soluble pharmaceutically acceptable salts, and methods for treating inflammatory conditions by administering said compositions.

3,728,350
1-(2-CARBOXYPHENYL)-5,7-DIMETHOXY-3,4-DIHYDROCARBOSTYRIL INTERMEDIATES FOR ACRONYCIS

James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 653,667, July 17, 1967, Pat. No. 3,624,087. This application July 6, 1971, Ser. No. 128,527
Int. Cl. C07d *33/00*
U.S. Cl. 260—287 R 1 Claim

The total synthesis of acronycine and related compounds with readily available 1-(2-carboxyphenyl)-5,7-dialkoxy-3,4-dihydrocarbostyrils is described, as are various classes of other intermediates useful in the synthesis.

3,728,351
RADIOIODINATED QUINOLINE DERIVATIVES

Raymond E. Counsell, and Persis Pocha Mehta, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed May 31, 1968, Ser. No. 733,248
Int. Cl. C07d *33/54*
U.S. Cl. 260—288 A 5 Claims

Radioiodinated analogs of 4-substituted-7-iodoquinolines when administered parenterally or orally are selectively concentrated in animal tissues containing melanin and may be used for the detection and location of melanotic tumors as well as other abnormal growths. The preferred quinoline compounds are 4-(dialkylaminoalkylamino)-7-iodoquinolines, such as for example 4-(3-dimethylaminopropylamino)-7-iodoquinoline. The radioiodinated compounds are prepared by isotope exchange between the natural iodinated compounds and radioactive alkali metal iodides.

3,728,352
PHENYLALKYLAMINOTETRAHYDROISOQUINOLINES

Sydney Archer, and John W. Schulenberg, both of Bethlehem, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 826,681, May 21, 1969, Pat. No. 3,557,120, which is a continuation-in-part of Ser. No. 569,021, Aug. 1, 1966. This application April 8, 1970, Ser. No. 26,765
Int. Cl. C07d *35/36*, *35/38*
U.S. Cl. 260—287 R 10 Claims

Reaction of a 1-aminomethyl-1,2,3,4-tetrahydro-6,7-dimethoxyisoquinoline with an aldehyde or ketone effects ring-closure to an imidazo compound, viz., a 1,2,3,5,6,10b-hexahydro-8,9-dimethoxyimidazo[5,1-a]isoquinoline and alkaline treatment of the related 1-[N-(α-halo lower-alkanoyl)]aminomethyl-2-benzyl-1,2,3,4-tetrahydro-6,7-dimethoxyisoquinoline effects ring-closure to a pyrazino compound, viz., a 1,3,4,6,7,11b-hexahydro-9,10-dimethoxy-2H-pyrazino[2,1-a]isoquinoline. The final products possess sedative, tranquilizing and related pharmacodynamic effects.

3,728,353
PREPARATION OF C-SUBSTITUTED PIPERIDINE

Siemen H. Groen; Johannes J. M. Deumens, both of Geleen, and Petrus A. M. J. Stijfs, Merkelbeek, all of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed July 10, 1970, Ser. No. 54,001
Claims priority, application Netherlands, July 11, 1969, 6910764
Int. Cl. C07d *29/06*
U.S. Cl. 260—293.52 7 Claims

A process for the preparation of a carbon-substituted piperidine by the hydrogenation of a N-substituted γ-cyanoketoimine in the presence of a hydrogenation catalyst, is disclosed. A primary amine having the same substituent as the

nitrogen atom of the starting γ-cyanoketoimine is receovered in high yield from the reaction mixture. The carbon substituted piperidines thus produced are useful as starting materials for the production of herbicides or pharmaceuticals.

3,728,354

2-PERCHLOROCROTONYLAMINO-5-TRIFLUOROMETHYL-1,3,4-THIADIAZOLE

Dietrich Rucker, Wuppertal-Elberfeld; Ludwig Eue, Cologne-Stammheim, and Helmuth Hack, Cologne-Buchheim, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 16, 1969, Ser. No. 842,369

Claims priority, application Germany, Aug. 1, 1968, P 17 95 037.7

Int. Cl. C07d *91/62*

U.S. Cl. 260—306.8 D **1 Claim**

2-(N-acyl)-amino-1,3,4-thiadiazoles, i.e. 2-[N-(optionally alkyl)-N-(alkanoyl, chloroalkanoyl, fluoroalkanoyl, alkenoyl, chloroalkenoyl, alkoxycarbonyl, alkoxyalkoxycarbonyl, alkenyloxycarbonyl, alkynyloxycarbonyl, and phenoxycarbonyl)-amino]-5-trifluoromethyl-1,3,4-thiadiazoles, which possess herbicidal properties, and which may be produced by conventional methods.

3,728,355

3-CARBOCYCLIC-5,5-DIALKYL-2-IMIDAZOLIDINETHIONES

John Joseph D'Amico, Akron, and Darrell Dexter Mullins, Norton, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 21, 1970, Ser. No. 74,145

Int. Cl. C07d *49/30*, *49/34*

U.S. Cl. 260—309.7 **2 Claims**

3-Carbocyclic-5,5-dialkyl-2-imidazolidinethiones useful as intermediates and accelerators of vulcanization of chloroprene rubbers.

3,728,356

THIOGLYCEROL-NITROGEN BASE MOLECULAR COMPLEX

Harvey A. Yablonsky, Elizabeth, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 812,903, April 2, 1969, Pat. No. 3,686,296. This application Dec. 15, 1971, Ser. No. 208,441

Int. Cl. C07c *149/24*, *149/14*

U.S. Cl. 260—309 **8 Claims**

A thioglycerol-nitrogen base molecular complex useful as a depilatory; complexes are unimolecular or hemimolecular.

3,728,357

2-(SUBSTITUTED-METHYL)-5,6-DIHYDRO-1,4-OXATHIIN-3-CARBOXAMIDES

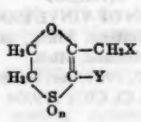
Barry I. Knight; Michael Curcumelli-Rodostamo; Marshall Kulka, all of Guelph, Ontario, Canada, and Bogislav Von Schmeling, Hamden, Conn., assignors to Uniroyal, Inc.

Filed Sept. 8, 1970, Ser. No. 78,344

Int. Cl. C07d *89/14*

U.S. Cl. 260—327 P **5 Claims**

Chemicals of the formula



wherein X can be various substituents, particularly halogen and univalent radicals containing a hetero atom, and Y is carboxamide, are useful as agricultural fungicides. The carboxamide may be variously substituted. Examples are 2-chloromethyl-5,6-dihydro-1,4-oxathiin-3-carboxanilide (X = chlorine, Y = phenylcarbamoyl, *n* = zero) and 5,6-dihydro-2-thiocyanomethyl-1,4-oxathiin-3-carboxanilide (X = thiocyano, Y = phenylcarbamoyl, n = zero).

3,728,358

PROCESS FOR THE PREPARATION OF MACROCYCLIC LACTONES

Braja D. Mookherjee, Matawan; William I. Taylor, Summit, both of N.J., and 104, 71, 18,701, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation of Ser. No. 18,701, March 11, 1970, abandoned.

Filed June 25, 1971, Ser. No. 156,955

Int. Cl. C07d *9/00*

U.S. Cl. 260—343 **4 Claims**

Macrocyclic ketones are converted into the corresponding lactones with a peracid in the presence of a boron trifluoride etherate catalyst and an inert solvent to form a reaction mixture. This mixture is heated until the conversion is complete and the desired lactones can be recovered by conventional means. The novel lactone obtained, 1-hydroxy-9-cyclohexadecanolide, is useful as a fragrance ingredient.

3,728,359

HYDROXY CYCLOHEXADECANOLIDES

Braja D. Mookherjee, Matawan, and William I. Taylor, Summit, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 18,684, March 11, 1970. This application June 25, 1971, Ser. No. 156,980

Int. Cl. C07d *9/00*

U.S. Cl. 260—343 **1 Claim**

A mixture of hydroxy cyclohexadecanolides is obtained by oxidation of hydroxy-cyclohexadecanones in the presence of a boron-trifluoride etherate catalyst. Said hydroxy cyclohexadecanolides are useful as intermediates for the production of ambrettolide and isomers thereof.

3,728,360

ESTER DERIVATIVES OF TETRAHYDROCANNABINOL

Harry G. Pars, Lexington; Raj K. Razdan, Belmont, and Klaus K. Weinhardt, Brighton, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 11,297, Feb. 13, 1970, abandoned. This application Aug. 31, 1971, Ser. No. 176,720

Int. Cl. C07d *7/18*

U.S. Cl. 260—345.3 **18 Claims**

Novel 1-[ω-(dilower-alkylamino)acyloxy]-3-alkyl(and cycloalkyl-lower-alkyl) 6a, 7,8,10a-(and 6a,7,10,10a- and 7,8,9,10-)tetrahydro-6,6,9-trilower-alkyl-6H-dibenzo[b,d]pyrans and acid salts thereof. These compounds possess biological acitivity and are useful as therapeutic agents.

3,728,361

SYNTHESIS OF HALOGENATED NAPHTHOQUINONES

Donald W. Fuhlhage, Kansas City, Mo., assignor to Thompson-Hayward Chemical Co., Kansas City, Kans.

Filed June 5, 1969, Ser. No. 830,887

Int. Cl. C07c *49/66*

U.S. Cl. 260—396 R **4 Claims**

This invention relates to a method of preparing halogenated naphthoquinones by hydrolyzing hexahalogenated dihydronaphthalene in an acid medium, at an elevated temperature and in the presence of available halogen.

3,728,362

(3-METHYL-5-CARBOXY-2-PENTENYL)QUINONES

Hiroshi Morimoto, Hyogo; Masazumi Watanabe, and Isuke Imada, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 8, 1971, Ser. No. 113,773

Claims priority, application Japan, Feb. 7, 1970, 45/10846; Feb. 11, 1970, 45/11616

Int. Cl. C07c *61/36, 69/74*

U.S. Cl. 260—396 R 10 Claims

The present invention relates to (3-methyl-5 carboxy-2-pentenyl) quinones, lower alkyl esters and pharmaceutically acceptable salts thereof. The compunds are useful as anti-inflammatory agents.

3,728,363

QUINONE DERIVATIVES

Hiroshi Morimoto, Hyogo; Masazumi Watanabe, Takatsuki, and Isuke Imada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

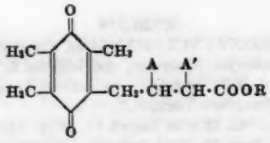
Filed March 15, 1971, Ser. No. 124,545

Claims priority, application Japan, March 17, 1970, 45/22497; March 18, 1970, 45/22805

Int. Cl. C07c *61/36, 69/74*

U.S. Cl. 260—396 R 5 Claims

Compounds of the formula



wherein one of A and A′ represents hydrogen and the other is a lower alkyl group and R is hydrogen, alkyl, cycloalkyl or unsaturated alkyl and pharmaceutically acceptable salts thereof have vitamin E and anti-inflammatory action.

3,728,364

PREPARATION OF 17ALPHA-PROPADIENYL STEROIDS

Pierre Crabbe, Mexico, Mexico, and John H. Fried, Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

Continuation-in-part of Ser. No. 148,173, May 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 817,562, April 18, 1969, abandoned. This application July 27, 1971, Ser. No. 166,628

Int. Cl. C07c *169/08, 169/20*

U.S. Cl. 260—397.4 24 Claims

Disclosed is a process for the preparation of 17a-propadienyl steroids of the estrogen, estrane, and androstane series which contain optional substitution at other positions of the nucleus. This process involves treating a corresponding 3-(halopropynyl) steroid with a metal, metal couple, or metal salt reagent in organic reaction media and in the presence of a proton donor. The product 17a-propadienyl steroids of the 6,6-difluoroandrostane and 19-norandrostane series, optionally substituted at the C-3, C-17, and C-18 positions, are new compounds. The 17a-propadienyl products are useful as estrogenic, anti-androgenic, and progestational agents.

3,728,365

CYCLOPENTADIENYL-(GROUP IV-B METAL) HYDROCARBYL SULFINATES

Joseph J. Mrowca, 1513 Forsythia Ave., Wilmington, Del.

Filed Sept. 25, 1970, Ser. No. 75,694

Int. Cl. C07f *7/28*

U.S. Cl. 260—429.5 9 Claims

Novel sulfinato derivatives of cyclopentadienyl-titanium and -zirconium compounds, useful as plant-growth regulants, are prepared (1) by reacting sulfur dioxide with certain unsubstituted or substituted (cyclopentadienyl) titanium or -zirconium compounds or (2) by reacting a hydrocarbon sulfinic acid salt with a compound of the formula Cp_aMX_{b+c}; e.g., bis(benzenesulfinato)dicyclopentadienyltitanium (1) from SO_2 and dicyclopentadienyldiphenyltitanium or (2) from sodium benzenesulfinate and dichloro(dicyclopentadienyl)-titanium.

3,728,366

LIQUID/LIQUID EXTRACTION OF COBALT VALUES

Manfred J. Michlmayr, San Francisco, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed April 5, 1971, Ser. No. 131,401

Int. Cl. C07f *15/06*; C22b *23/00*

U.S. Cl. 260—439 R 5 Claims

Selective extraction of cobalt from alkaline aqueous solutions of its salts with organic solutions of lower diphenylphosphinocarboxylic acids and their oxides is disclosed.

3,728,367

SOLUTION CONTAINING A TRIVALENT ANTIMONY-TARTARIC ACID COMPOUND

Paul C. Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1970, Ser. No. 93,864

Int. Cl. C07f *9/90*

U.S. Cl. 260—446 13 Claims

Solutions of monomeric trivalent antimony-tartaric acid compounds having a molar ratio of antimony to tartaric acid of 1 to 1 to 2 to 1 stabilized with an anion such as chloride in certain polar organic solvents are useful for incorporating flame-retarding antimony compounds into polymeric articles.

3,728,368

PROCESS FOR THE PREPARATION OF ARYLDIMETHYLCHLOROSILANE

Andre Bazouin, Luzinay, and Marcel Lefort, Caluire, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed April 22, 1971, Ser. No. 136,567

Claims priority, application France, April 23, 1970, 7014777

Int. Cl. C07f *7/08, 7/12*

U.S. Cl. 260—448.2 P 9 Claims

Aryldimethylchlorosilanes, useful as reactive intermediates in organosilicon chemistry, are prepared by reacting a diaryldimethylsilane with an organochlorosilane $R_{4-n}Si\ Cl_n$, where R is an aliphatic or aromatic hydrocarbon group and $n = 1$ or 2, in the presence of aluminium trichloride.

3,728,369

STABILIZATION OF VINYL ISOCYANATES

Dietrich H. Heinert, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 7, 1969, Ser. No. 874,981

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 SP 9 Claims

Vinyl-type isocyanates, such as vinyl, isopropenyl, styryl, and vinylphenyl isocyanates, are stabilized by acidified lower aliphatic dialkyl ketals, such as 2,2-dimethoxypropane and -butane and 2,2-diethoxypropane. Such ketals inhibit discoloration and/or formation of solids.

3,728,370

CATALYTIC PROCESS FOR CONVERTING AROMATIC NITRO COMPOUNDS TO AROMATIC ISOCYANATES

Gerhard F. Ottmann, Wuppertal-Elberfeld, Germany; Wilhelm J. Schnabel, Branford, and Eric Smith, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 703,252, Feb. 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 625,580, March 24, 1967, abandoned. This application Sept. 16, 1970, Ser. No. 72,863

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 PC 14 Claims

In the process for providing an organic isocyanate by the reaction of an organic nitro compound with carbon monoxide in the presence of a noble metal based catalyst, the improvement which comprises performing the reaction in the presence of an unsaturated organic compound having at least one multiple bond conjugated to another multiple bond in selected aliphatic or cycloaliphatic systems or in the presence of an unsaturated organic compound having at least one multiple bond conjugated to an aromatic hydrocarbon nucleus.

3,728,371

3-MERCAPTO-2-CHLOROPROPYL-N,N-DIHYDROCARBYL THIOLCARBAMATES

William Carter Doyle, Jr., Leawood, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 854,344, July 30, 1969, Pat. No. 3,634,457, which is a division of Ser. No. 625,603, March 24, 1967, Pat. No. 3,510,290. This application April 23, 1971, Ser. No. 137,079

Int. Cl. C07c *155/08*

U.S. Cl. 260—455 A 10 Claims

By a method of synthesis based on a secondary amine, carbon disulfide and epichlorohydrin there are produced 2,3-epithiopropyl N,N-dialkylthiolcarbamates which are used as selective herbicides, particularly in pre-emergent control of grasses such as brome and volunteer oats.

3,728,372

CHRYSANTHEMIC ACID PREPARATION

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Jan. 18, 1971, Ser. No. 107,429

Int. Cl. C07c *143/68*

U.S. Cl. 260—456 R 3 Claims

Syntheses of chrysanthemic acid and esters involving reduction of 3,3,6,6-tetramethylbicyclo [3.1.0] hexane-2,4-dione, esterification to a sulfonic acid ester, and ring cleavage.

3,728,373

METHOD FOR MAKING CYANACRYLIC ACID ESTERS

Wolfgang Imohel, Unna, and Peter Borner, Altluene, both of Germany, assignors to Schering AG, Bergkamen/Westfalia, Germany

Filed May 20, 1971, Ser. No. 145,242

Claims priority, application Germany, May 29, 1970, P 20 27 502.9

Int. Cl. C07c *121/46*, *121/52*

U.S. Cl. 260—464 6 Claims

A method for making cyanacrylic acid esters by depolymerizing polycyanacrylic acid esters continuously. The polymer, admixed with an inert liquid of high boiling point and a polymerization inhibitor, is depolymerized by heating a thin layer of this mixture — up to 5 centimeters thick — at a temperature from 150° – 250°C. at a pressure of 0.5 – 40 mmHg.

3,728,374

CYANOVINYLENE-TRIARYLAMINES

John G. Fisher, and Curtis E. Diebert, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 4, 1972, Ser. No. 215,439

Int. Cl. C07c *121/70*

U.S. Cl. 260—465 D 7 Claims

Cyanovinylene-substituted triarylamine compounds produce fluorescent, light-fast greenish-yellow to yellow shades on polyester and cellulose acetate fibers.

3,728,375

CYANOACRYLATE ADHESIVE COMPOSITIONS

Harry W. Coover, Jr.; John M. McIntire, both of Kingsport, Tenn.; assignors to Eastman Kodak Company, Rochester, N.Y.

This application May 12, 1971, Ser. No. 142,816

Int. Cl. C07c *121/30*, *121/48*, *121/52*; C07d *9/00*

U.S. Cl. 260—465.4 10 Claims

This invention relates to cyanoacrylate adhesive compositions containing less than about 200 parts per million of water. These compositions have unique long-term adhesive activity which extends their utility for periods up to 2 years and longer.

3,728,376

CATALYTIC REDUCTION PROCESS

Joseph Levy, and William Walker, both of Rutherford, N.J., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 15, 1970, Ser. No. 46,513

Int. Cl. C07c *101/18*

U.S. Cl. 260—472 12 Claims

Catalytic reduction of an ester of a nitrobenzoic acid and tertiary-amino alcohol to the corresponding amine by gradually adding the ester to an agitated suspension of noble metal catalyst in inert water immiscible solvent under hydrogen pressure. Improved yields and product purity are obtained in a more facile manner.

3,728,377

4,4-BIS(ALKOXYCARBONYL)BENZOIN ETHERS

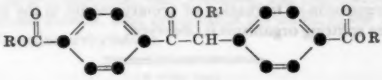
Charles A. Kelly, and James G. Pacifici, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 5, 1972, Ser. No. 260,702

Int. Cl. C07c *69/78*

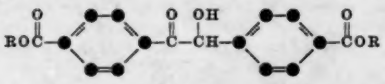
U.S. Cl. 260—473 R 6 Claims

Disclosed are certain novel 4,4′-bis(alkoxycarbonyl)benzoin ethers which have the formula



and which are useful as photoinitiators of polymerization, e.g., in the formation of coatings and thin films. The novel 4,4′-bis(alkoxycarbonyl)-benzoin ethers are prepared by contacting aldehydes of the formula

with a cyanide catalyst to form 4,4'-bis(alkoxycarbonyl)benzoins of the formula



and by reacting such 4,4'-bis(alkoxycarbonyl)benzoins with an alcohol of the formula R^1OH to form a 4,4'-bis(alkoxycarbonyl)benzoin ether of the foregoing formula. Each of R and R^1 are straight or branched chain alkyl of one to 10 carbon atoms.

3,728,378

QUATERNARY ALKYL AROMATICS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 21,182, March 19, 1970, abandoned. This application April 28, 1970, Ser. No. 32,767

Int. Cl. C07c *63/06, 69/78*

U.S. Cl. 260—476 R **15 Claims**

Quaternary alkylated aromatics prepared by alkylation of unsaturated bond using dialkylcopper lithium which are useful for control of insects.

3,728,379

PROPOXYPHENE SALTS

Verlin C. Stephens, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 29, 1971, Ser. No. 158,126

Int. Cl. C07c *143/84*

U.S. Cl. 260—490 **7 Claims**

The α-d and α-l forms of the 4-chloro-m-toluene-sulfonate and 3,4-dichlorobenzenesulfonate salts of propoxyphene. These salts are suitable for formulation of these analgesic and antitussive compounds into aqueous suspensions having acceptable taste characteristics.

3,728,380

P-CHLOROBENZAMIDOACETOHYDROXAMIC ACID

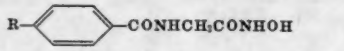
Roland N. Johnson, and Jon A. Andersen, both of Norwick, N.Y., assignors to Morton-Norwich Products, Inc., Norwick, N.Y.

Filed May 17, 1971, Ser. No. 144,322

Int. Cl. C07c *103/30;* **A61k** *27/00*

U.S. Cl. 260—500.5 H **1 Claim**

Novel benzamidoacetohydroxamic acids of the formula:



wherein R is nitro or chloro are potent inhibitors of urease. Combined with urinary tract antibacterials an improvement in the prevention of formation of urinary calculi in the presence of urea splitting organisms is observed.

3,728,381

PRODUCTION OF 2-HALOETHYLPHOSPHONIC ACID

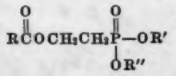
David L. Randall, and Calvin Vogel, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,481

Int. Cl. C07d *9/38;* **A01n** *5/00*

U.S. Cl. 260—502.4 R **9 Claims**

2-Haloethylphosphonic acids are prepared from 2-acyloxyethylphosphonic acids or esters of the formula:



wherein R is alkyl, cycloalkyl, haloalkyl or aryl and R' is hydrogen, alkyl, haloalkyl, cycloalkyl and R'' is the same or different as R', or R' and R'' are joined by methylene groups to form a heterocyclic ring, by anhydrous hydrogen halide cleavage at a temperature of about 30°–200°C. The products are useful as plant growth regulators.

3,728,382

15-METHYL AND 15-ETHYL PROSTAGLANDIN ANALOGS

Gordon L. Bundy, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 4, 1970, Ser. No. 34,518

Int. Cl. C07c *61/32*

U.S. Cl. 260—514 D **3 Claims**

Prostaglandin E and F compounds with a methyl or an ethyl substituent at the C–15 position are disclosed. These are useful for the same pharmacological purposes as the unsubstituted prostaglandins.

3,728,383

α(M-ALKOXYPHENOXY) AND α(M-TRIFLUOROMETHYLPHENOXY) M-TOLUIC ACIDS

Charles Malen, Fresnes; Bernard Danree, St. Germain en Laye, and Pierre Desnoyers, Fontenay aux Roses, all of France, assignors to Societe en nom Collectiv "Science Union et Cie," Societe Francaise de Recherche Medicale, Suresnes, France

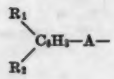
Filed Dec. 29, 1969, Ser. No. 888,941

Claims priority, application Great Britain, Jan. 6, 1969, 726/69

Int. Cl. C07c *65/00*

U.S. Cl. 260—520 **3 Claims**

Meta-toluic acid α-substituted by the radical of the formula



wherein:

A is oxygen, sulfur, imino- or lower-alkylimino, and

R_1 and R_2 are hydrogen, halogen, lower alkoxy or trifluoromethyl, provided that R_1 and R_2 are not simultaneously hydrogen, when A is oxygen.

These compounds possess thrombolytic, fibrinolytic, vascular brittleness inhibiting and immunodepressant activities.

3,728,384

METHOD OF PRODUCING 1,8-NAPHTHALDEHYDE MONOCARBOXYLIC

Anatoly Tikhonovich Menyailo; Inna Evgenievna Pokrovskaya; Mikhail Valerievich Pospelov, and Antonina Karpovna Yakovleva, all of Moscow, U.S.S.R., assignors to Nauchno-Issledovatelsky Institut sinteticheskikh spirtov, Moscow, U.S.S.R.

Filed July 24, 1970, Ser. No. 58,209

Int. Cl. C07c *51/34*

U.S. Cl. 260—523 R **12 Claims**

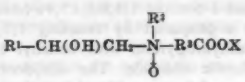
A method of producing 1,8-naphthaldehyde monocarboxylic acid, characterized in that acenaphthylene is ozonized in the medium of a lower aliphatic alcohol, or in a mixture of a lower aliphatic alcohol with water, or in a mixture of an aliphatic ketone with water, in the presence of an alkaline earth metal hydroxide. The resulting reaction mass is treated with hydrochloric acid, the formed 1,8-naphthaldehyde monocarboxylic acid is separated from the alkaline earth metal hydroxide and washed to remove the traces of hydrochloric acid.

3,728,385
N-OXIDE-IMINODICARBOXYLATES

Bjorn Sundby, Piscataway; Edward J. Kenney, Bernardsville, and Harold E. Wixon, New Brunswick, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,909
Int. Cl. C07c *101/12*
U.S. Cl. 260—534 E 5 Claims

Novel oxides of aminocarboxylates or aminocarboxylic acids are of the formula:



wherein R^1 is an aliphatic hydrocarbon radical of four to 20 carbon atoms, R^2 is a hydrocarbon radical of one to four carbon atoms or is R^3COOX, R^3 is a divalent aliphatic or aromatic hydrocarbon radical of one to nine carbon atoms, which may be the same as or different from another R^3 radical which may be prsent in the compound, X is hydrogen, alkali metal, alkaline earth metal, other suitable salt-forming metal, ammonium, alkylamine or alkanolamine, which may be the same as or different from any other X in the formula, with it being understood that in the case of divalent or trivalent X's it may be joined to a plurality of the shown organic moieties through the carboxylic oxygen(s) thereof.

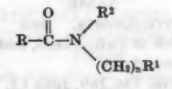
The novel compounds are possessed of surface activity and are substantive to fibrous materials, e.g., cotton and wool. They may be used as detergents or components of detergent compositions and serve as softeners for fibrous materials.

3,728,386
N-CYCLOALKYLALKYL AND N-CYCLOALKYL SUBSTITUTED PHENYL UREAS AND HALO ACETAMIDES

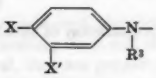
Lester L. Maravetz, Westfield, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Filed July 27, 1970, Ser. No. 58,672
Int. Cl. C07c *127/18*
U.S. Cl. 260—553 A 6 Claims

Compounds characterized by the following structural formula:



wherein R is one selected from the group consisting of Y—CH_2 and



Y is one selected from the group consisting of chlorine, bromine and fluorine, X is one selected from the group consisting of hydrogen, chlorine, CF_3, C_1 to C_4 alkyl, bromine, C_1 to C_4 alkoxy, and C_1 to C_4 alkylthio, and X′ is one selected from the group consisting of chlorine, hydrogen, CF_3, and bromine; R^1 is C_3 to C_4 cycloalkyl optionally substituted with C_1–C_3 alkyl, chlorine, bromine, R^2 is one selected from the group consisting of hydrogen, and C_1 to C_4 alkyl, cyclopropyl, cyclopropylmethyl and C_1 to C_3 alkoxy, and R^3 is one selected from the group consisting of hydrogen, C_1–C_3 alkyl, cyclopropyl, cyclobutyl, cyclopropylmethyl or cyclobutylmethyl, optionally substituted with C_1 to C_3 alkyl, chlorine, and bromine; *n* is either 0 or 1.

These compounds have been found to possess biological activity and have been found to be useful as herbicides.

3,728,387
ACRYLAMIDE OF METHACRYLAMIDE MONOMER WITH N-SUBSTITUTED AMININMIDE RESIDUES

Richard E. Freis, Bloomington, Minn., and Billy M. Culbertson, Worthington, Ohio, assignors to Ashland Oil, Inc., Columbus, Ohio

Filed March 17, 1972, Ser. No. 235,814
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 H 10 Claims

N-substituted acryl- and methacrylamides are disclosed which compounds as a class are structurally characterized in having an amido substituent in the form of a methylene or polymethylene radical terminally containing a quaternary ammonium acylimine group. These vinyl aminimide monomers can be homo- or copolymerized to provide either linear thermosetting polymers or linear polymers from whence thermoset cross-links can be derived, all having recognized utility in a variety of coating applications.

3,728,388
1-AMINO-2,3-DISUBSTITUTED CYCLOPROPENYLIUM SALTS

John W. Schulenberg, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,618
Int. Cl. C07c *87/40*
U.S. Cl. 260—563 P 13 Claims

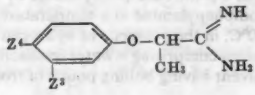
1,2,3-Trisubstituted-cyclopropenylium salts having antibacterial and antiviral activity and prepared either by reaction of a 2,3-disubstituted-cyclopropenone with a trialkyloxonium tetrafluoroborate followed by reaction of the resulting 1-alkoxycyclopropenylium tetrafluoroborate with an amine or by reacton of a 2,3-disubstituted-cyclopropenone with an organo metallic compound followed by treatment of the resulting carbinol with a strong acid.

3,728,389
BIOLOGICALLY ACTIVE AMIDINES AND THEIR PREPARATION

Harold Francis Hodson, and Anthony Winchester Randall, both of London, England, assignors to Burroughs Wellcome Co., North Carolina Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 644,064, June 7, 1967, abandoned. This application Dec. 15, 1969, Ser. No. 885,307
Int. Cl. C07c *123/00*
U.S. Cl. 260—564 R 10 Claims

Amidine compounds of the formula



in which one of Z^3 and Z^4 is halogen, hydrogen, trifluoromethyl or lower alkoxy when the other is hydrogen; salts of these compounds; their synthesis; and pharmaceutical preparations thereof. Said compounds are useful in the treatment of cardiac arrhythmias.

3,728,390
PREPARATION OF AZINES

Trevor Jenkins; Brian John Needham, and Michael Arthur Smith, all of Loughborough, England, assignors to Fisons Limited, London, England

Continuation of Ser. No. 543,073, April 18, 1966, abandoned. This application Oct. 7, 1970, Ser. No. 78,972
Claims priority, application Great Britain, April 20, 1965, 16,666/65
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 B 27 Claims

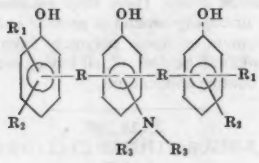
Azines and isohydrazones are prepared in high yields by first reacting chlorine and gaseous ammonia to form chloramine and then reacting the thus-formed chloramine with aqueous ammonia and a carbonyl compound.

3,728,391
2,6-BIS-[(2-HYDROXY-ALKYL-PHENYL) METHYL]-4-AMINO-PHENOLS

Michael Robin, Colonia, N.J., and Sheldon R. Schulte, Columbus, Ohio, assignors to Ashland Oil, Inc., Houston, Tex.

Filed March 20, 1970, Ser. No. 21,523
Int. Cl. C07c *87/28*
U.S. Cl. 260—570 R **13 Claims**

Novel UV stabilizers of the following formula:



wherein each R individually is a saturated aliphatic hydrocarbon group or linkage of one to eight carbon atoms, each R_1 and R_2 individually is a bulky hydrocarbon group having from 1 to 22 carbon atoms or is an amino substituted alkyl of from one to 22 carbon atoms or is $—NR_3R_3$ or is hydrogen and each R_3 individually is either hydrogen or a lower alkyl of 1 to 8 carbon atoms, or both R_3's are linked together so that $—NR_3R_3$ forms a heterocyclic ring, and at least one R_1 and/or R_2 on each phenolic nucleus being other than hydrogen, and provided along with the method of preparation.

3,728,392
PREPARATION OF P-NITROSODIPHENYLAMINE

Joseph Levy, Paramus, N.J., and Louis Self, Bronx, N.Y., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 20, 1970, Ser. No. 56,692
Int. Cl. C07c *87/54*
U.S. Cl. 260—576 **10 Claims**

Preparation of a p-nitrosodiphenylamine by rearrangement of an N-nitrosodiphenylamine at a temperature of from about 20° to about 50°C. in the presence of hydrogen chloride and a two solvent system comprising a water immiscible alcohol and an aromatic solvent having boiling points of from about 80° to about 160°C.

3,728,393
PROCESS OF SYNTHESIS OF LONG-CHAIN ALIPHATIC AMINES

Rene Gaige, Pont de Glaix, and Gerard Schneider, Caluire, both of France, assignors to Progil, Paris, France

Filed Oct. 23, 1969, Ser. No. 868,825
Claims priority, application France, Oct. 31, 1968, 650571
Int. Cl. C07c *85/02*
U.S. Cl. 260—585 A **7 Claims**

Process of synthesizing long-chain aliphatic primary amines by reacting 1-bromo-alkanes with an excess of ammonia at a temperature not exceeding the critical temperature of ammonia, for example at 60°–130°C, under a pressure of 5 to 40 atmospheres in the presence of a solvent which is a mixture of an organic compound and water which forms an homogeneous minimum boiling point azeotrope.

3,728,394
POLYSUBSTITUTED DIHYDROPYRENES

Luther A. R. Hall, Woodcliff Lake, N.J.; John A. Gurney, Tarrytown, N.Y., and Harris B. Renfroe, Montvale, N.J., assignors to Ciba-Geigy Corporation

Division of Ser. No. 635,287, April 7, 1967, Pat. No. 3,557,218, which is a continuation-in-part of Ser. No. 499,064, Oct. 20, 1965, abandoned. This application Oct. 16, 1970, Ser. No. 81,578
Int. Cl. C07c *49/76*
U.S. Cl. 260—591 **1 Claim**

The compound 2-benzoyl-1,3,6,8,15,16-hexamethyl-15,16-dihydropyrene is prepared by reacting 1,3,6,8,15,16-hexamethyl-15,16-dihydropyrene with benzoyl chloride in the presence of stannic chloride. The dihydropyrene starting material is prepared by a multi-step synthesis starting with trimethylphenol. The compound is useful as a photochromic material.

3,728,395
INSECT CONTROL

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed March 29, 1971, Ser. No. 129,217
Int. Cl. C07c *49/20*, *49/24*
U.S. Cl. 260—594 **7 Claims**

Long chain aliphatic carbonyl compounds having mono-unsaturation at position C-2,3 which are useful for the control of insects.

3,728,396
ALIPHATIC KETONES

John B. Siddall, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 78,908, Oct. 7, 1970. This application Oct. 12, 1970, Ser. No. 80,128
Int. Cl. C07c *49/12*
U.S. Cl. 260—593 R **7 Claims**

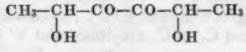
Preparation of novel carbonyl compounds useful as lubricants, plasticizers, intermediates, odorants and insect control agents.

3,728,397
DIOL DIONE COMPOUNDS AND METHOD OF MAKING SAME

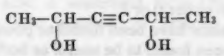
Luciano Re, Meyrin/Geneva, and Gunther Ohloff, Bernex/Geneva, both of Switzerland, assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 736,269, June 12, 1968, Pat. No. 3,576,014. This application Dec. 12, 1969, Ser. No. 889,811
Claims priority, application Switzerland, June 16, 1967, 8620/67; June 5, 1968, 8254/68
Int. Cl. C07c *49/12*
U.S. Cl. 260—594 **4 Claims**

A process for the preparation of dioldione compounds of the formula



by ozonizing an reducing a compound of the formula



3,728,398

PREPARATION OF FORMALDEHYDE

Raymond Maux, Bully-les-Mines, France, assignor to Societe Chimique des Charbonnages, Paris, France

Filed March 17, 1970, Ser. No. 20,256

Claims priority, application France, March 20, 1969, 6908178

Int. Cl. C07c *45/16*

U.S. Cl. 260—603 HF 4 Claims

This invention relates to an improved process for the preparation of formaldehyde by oxidising methanol by air in the presence of a silver catalyst and is characterised in that the gases leaving the installation after separation of the condensable products, viz. water, methanol and formaldehyde, are at least partly reinjected in the cold state into the gaseous mixture leaving the catalyst layer.

3,728,399

AKYLTHIO SUBSTITUTED POLYNUCLEAR PHENOLS

Ronald B. Spacht, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 664,601, Aug. 30, 1967, Pat. No. 3,565,857. This application Sept. 10, 1970, Ser. No. 71,230

Int. Cl. C07c *149/36*, *149/38*

U.S. Cl. 260—609 F 4 Claims

Alkylthio substituted polynuclear phenolic age resisters and age resistant polymers containing said age resisters.

3,728,400

PROCESS FOR PREPARATION OF POLYMERCAPTANS

Francis W. Michelotti; John M. Jordan, both of Easton, Pa., and Neville P. Cook, Ringoes, N.J., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Sept. 17, 1970, Ser. No. 73,635

Int. Cl. C07c *149/14*, *149/10*

U.S. Cl. 260—609 A 7 Claims

Polymercaptans especially suitable as epoxy resin curing agents are produced by reacting a polyhalo compound with sodium sulfhydrate in the presence of dimethyl sulfoxide, dimethylformamide, a dimethylformamide-(lower) alkyl alcohol mixture or a dimethyl sulfoxide-(lower)alkyl alcohol mixture as a solvent for the reaction system.

3,728,401

ALPHA-HALOGENO-LAUROYL PEROXIDES, SOLUTIONS THEREOF, AND METHODS OF PREPARING THEM

Georgette Steinbach Van Gaver, Paris, France, assignor to Produits Chemiques Pechiney Saint-Gobain, Paris, France

Filed Dec. 29, 1966, Ser. No. 605,628

Claims priority, application France, Jan. 17, 1966, 6646153

Int. Cl. C07c *73/02*

U.S. Cl. 260—610 D 3 Claims

New alpha-halogeno-lauroyl peroxides are described with novel processes of making them and with some reference to their uses. In general, they are prepared by mixing an alpha-halogeno-lauroyl halide diluted in a solvent inert to the constituents of the reaction medium with hydrogen peroxide in the presence of caustic soda under conditions of temperature, pressure, agitation favorable to their reaction.

3,728,402

DIACYL PEROXIDES

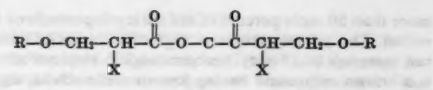
Donald L. Deardorff, Riverside; Edwin T. Chesler, East Providence, and Joseph L. Fath, Barrington, all of R.I., assignors to Teknor Apex Company, Pawtucket, R.I.

Continuation-in-part of Ser. No. 662,578, Aug. 23, 1967, abandoned. This application May 15, 1968, Ser. No. 729,451

Int. Cl. C07c *73/02*

U.S. Cl. 260—610 D 3 Claims

3-Alkoxy acyl peroxides having the formula:



in which R is alkyl containing from one to 14 carbon atoms, and X is hydrogen or methyl are new compounds which resemble common diacyl peroxides in manner of decomposition, but exhibit important differences in chemical and physical properties. The new peroxides are liquids at ambient temperatures and possess a higher degree of thermal stability than the commonly used aliphatic acyl peroxides of similar structure and molecular weight. The new compounds, and especially the 3-alkoxyisobutyryl peroxides, are suitable for use as initiators for the polymerization or copolymerization of ethylenic monomers and for the cross-linking of unsaturated polyesters.

3,728,403

PROCESS FOR PREPARING 2,5-DICHLORO-4-BROMOPHENOL

Frank Ross, Villa Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 511,356, Dec. 3, 1965, which is a continuation-in-part of Ser. No. 393,397, abandoned. This application Sept. 9, 1968, Ser. No. 758,621

Int. Cl. C07c *39/27*, *39/30*

U.S. Cl. 260—623 H 7 Claims

A process for the production of 2,5-dichloro-4-bromophenol which comprises contacting 2,5-dichlorophenol with a substantially equimolar amount of bromine in the presence of a catalytic quantity of iodine.

3,728,404

SPIRO COMPOUNDS

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 6, 1968, Ser. No. 734,852

Int. Cl. C07c *17/32*, *23/04*

U.S. Cl. 260—648 D 8 Claims

Spiro compounds having a cyclopropane ring and a ring containing an olefinic double bond are prepared by dihalocarbene addition to certain unsaturated cyclic hydrocarbons.

3,728,405

PROCESS FOR PREPARING POLYFLUOROPERHALOCYCLOBUTENES

John Allan Thoroughgood, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 14, 1970, Ser. No. 72,027

Int. Cl. C07c *17/00*, *23/06*

U.S. Cl. 260—648 F 6 Claims

An improved process for the preparation of polyfluoroperhalocyclobutenes by reacting hexachlorobutadiene with hydrogen fluoride at 300°–500° C. in the presence of a zinc fluoride catalyst.

3,728,406

PROCESS FOR THE PREPARATION OF 5-VINYLNORBORNENE-2

Cornelis H. Vrinssen, Geleen, and Constant M. A. Cramers, Obbicht, both of Netherlands, assignors to Stamicarbon N. V., Heerlen, Netherlands

Filed Dec. 7, 1971, Ser. No. 205,753

Claims priority, application Netherlands, Dec. 12, 1970, 7018160

Int. Cl. C07c *5/24*

U.S. Cl. 260—666 PY 9 Claims

A process for preparing 5-vinyl norbornene-2 is disclosed, wherein butadiene is reacted with cyclopentadiene and/or dicyclopentadiene, with the reaction discontinued when no

more than 50 mole percent of the (di)cyclopentadiene is converted. The process produces high efficiencies of converted raw materials into 5-vinyl norbornene-2. 5-vinyl norbornene-2 is a known compound having known use, such as, e.g., as a monomer suitable for polymerization with ehtylene and propylene into rubbery polymers.

3,728,407

PROCESS FOR THE PREPARATION OF 1,2-BIS(3-CYCLOHEXEN-1-YL) ETHYLENE USING BASE-TREATED OLEFIN DISPROPORTIONATION CATALYSTS

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 22, 1971, Ser. No. 211,068
Int. Cl. C07c *13/38*
U.S. Cl. 260—666 PY **8 Claims**

The olefin disproportionation conversion of 4-vinylcyclohexene to 1,2-bis(3-cyclohexen-1-yl)ethylene is improved by using a base-treated olefin disproportionation catalyst which is washed with a polar solvent (e.g., water) subsequent to the base treatment and prior to activation of the catalyst.

3,728,408

CONVERSION OF POLAR COMPOUNDS USING HIGHLY SILICEOUS ZEOLITE-TYPE CATALYSTS

Michael A. Tobias, Piscataway, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1969, Ser. No. 821,940
Int. Cl. C07c *1/20*
U.S. Cl. 260—668 C **4 Claims**

A method of converting an organic polar compound comprising contacting the same in a conversion zone under conversion conditions with a crystalline aluminosilicate catalyst the silica/alumina ratio of which is more than 10/1.

3,728,409

PROCESS FOR MAKING POLYNUCLEAR AROMATIC COMPOUNDS

Charles M. Selwitz, Monroeville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 5, 1970, Ser. No. 87,289
Int. Cl. C07c *15/14*
U.S. Cl. 260—668 C **12 Claims**

A process for the production of a polynuclear aromatic compound from an aromatic compound having a labile hydrogen atom attached to its nucleus which involves heating the latter aromatic compound with a noble metal salt of an organic acid in the presence of a strong acid and molecular oxygen in a reaction system free of halide ions and nitrate ions.

3,728,410

HYDROCARBON CONVERSION

Thomas R. Hughes, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 25, 1971, Ser. No. 109,715
Int. Cl. C07c *15/02, 15/14*
U.S. Cl. 260—668 B **9 Claims**

A process for converting an alkyl aromatic to a different alkyl aromatic which comprises contacting the alkyl aromatic and an alkane having at least two carbon atoms with a catalyst mass having a component which has catalytic activity for alkane dehydrogenation and a second component which has catalytic activity for olefin averaging. Preferred alkyl aromatic feedstocks are ethyl benzene and butyl benzene. A particularly preferred catalytic mass for the reaction comprises platinum on alumina and tungsten oxide on silica.

3,728,411

ACID CATALYZED CONVERSION OF AROMATICS TO ALKYL AROMATICS

Michael Siskin, Maplewood, and Joseph J. Porcelli, Scotch Plains, both of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 96,263, Dec. 8, 1970, abandoned. This application Jan. 31, 1972, Ser. No. 222,275
Int. Cl. C07c *15/02*
U.S. Cl. 260—668 R **11 Claims**

A process for making ethyl benzene and other valuable products by contacting either toluene or benzene with a catalyst system consisting essentially of niobium or tantalum pentafluoride dissolved in anhydrous liquid hydrogen fluoride.

3,728,412

REMOVAL OF ACETYLENES FROM OLEFINIC AND PARAFFINIC HYDROCARBONS

Harlin D. Johnston, and Dennis L. Ripley, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 3, 1972, Ser. No. 215,169
Int. Cl. C07c *11/12*
U.S. Cl. 260—677 A **5 Claims**

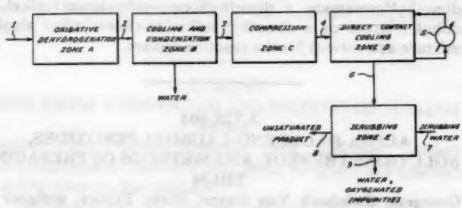
A process for the selective removal of acetylenes from olefinic and/or paraffinic hydrocarbons, wherein the hydrocarbons are contacted at elevated temperatures with a supported barium catalyst in the presence of steam.

3,728,413

REDUCED FOULING IN OXIDATIVE DEHYDROGENATION PROCESS

Rudolph C. Woerner, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 775,862, Nov. 14, 1968, Pat. No. 3,683,042. This application Aug. 4, 1970, Ser. No. 60,899
Int. Cl. C07c *5/18*
U.S. Cl. 260—680 D **12 Claims**



Oxygenated impurities are separated from oxidative dehydrogenation effluents by treating the effulent by cooling, compressing, cooling by direct contact with water and scrubbing. Reduced fouling of equipment is achieved.

3,728,414

OLEFIN DISPROPORTIONATION

Robert Van Helden; Charles F. Kohll, and Pieter A. Verbrugge, all of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Sept. 14, 1970, Ser. No. 72,161
Claims priority, application Netherlands, Feb. 27, 1970, 7002795
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **6 Claims**

Olefins are disproportionated in the presence of a novel catalyst composition comprising (*a*) a conventional olefin disproportionation catalyst, (*b*) a Group IIIa metal, Group IIIa metal compound or mixtures thereof and (*c*) a carrier of at least 75 percent alumina. The novel catalyst has a long catalytic lifetime and good disproportionation activity.

3,728,415

PRODUCTION OF N-BUTENES FROM ETHYLENE

Robert P. Arganbright, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed March 25, 1971, Ser. No. 128,144
Int. Cl. C07c 3/20
U.S. Cl. 260—683.15 R 9 Claims

Ethylene can be dimerized in excellent yields over a unique catalyst of palladium oxide with molybdenum oxide and/or tungsten oxide on a catalyst support. The catalyst is specific for ethylene. For example 52 weight % n-butenes were produced over a 2% PdO – 10% MoO_3 on Alcoa H-151 alumina at an ethylene feed rate of 50 ml/min. at 35°C. A 2% PdO–10% WO_3 on Alcoa H-151 alumina at ethylene feed rate of 100 ml/min. and 70°C. gave 56 wt. % n-butenes.

3,728,416

PROCESS FOR PRODUCING HIGH SOFTENING, NON-CRYSTALLINE CONDENSATION COPOLYMERS

George A. Akin, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 846,575, July 31, 1969, abandoned. This application Aug. 25, 1971, Ser. No. 174,981
Int. Cl. C08g 39/10
U.S. Cl. 260—860 4 Claims

An improved process for the preparation of copolymers from a copolymer derived from terephthalic acid, isophthalic acid and Bisphenol A and a homopolymer derived from isophthalic acid and Bisphenol A by extruding a molten mixture of the copolymer and the homopolymer whereby copolymerization of the two p9lymers occurs in situ to produce a randomized copolymer. The process is thus useful in the production of a copolymer product which finds application in the production of fibers, films, sheets, molded objects and other products.

3,728,417

PERESTER FREE RADICAL INITIATOR FOR GRAFT POLYMERIZATION

Donald F. Knaack, Wilmington, Del., assignor to Avisum Corporation, Philadelphia, Pa.

Filed Dec. 5, 1968, Ser. No. 781,573
Int. Cl. C08f 15/04
U.S. Cl. 260—878 10 Claims

A polyolefin graft polymer is prepared by the graft polymerization of at least one ethylenically unsaturated monomer onto a polyolefin using a perester free radical initiator selected from the group consisting of t-butyl 2-ethylperhexanoate, t-amyl 2-ethylperhexanoate, t-butyl 3,5,5-trimethylperhexanoate, t-amyl 3,5,5-trimethylperhexanoate, t-butyl 2-ethylperbutyrate, t-amyl 2-ethylperbutyrate, t-butyl perisobutyrate and t-amyl periso butyrate.

3,728,418

BLEND OF STYRENE POLYMERS FOR USE IN FLOOR POLISH COMPOSITIONS

Edward Hinsdale Gleason, Monroeville, Pa., assignor to Sinclair-Koppers Company, Pittsburgh, Pa.

Division of Ser. No. 791,776, Jan. 16, 1969, abandoned. This application Oct. 13, 1970, Ser. No. 80,501
Int. Cl. C08f 29/56
U.S. Cl. 260—898 1 Claim

A floor polish composition having excellent resistance to plasticizer migration contains water, a mixture of a styrene copolymer (styrene and acrylic or methacrylic acid) and a styrene multi-polymer (styrene, acrylic acid, an ester of acrylic acid and acrylonitrile) and suitable waxes, alkali soluble resins and surfactants.

3,728,419

PHOSPHATED MIXED ESTERS OF HYDROXY AMINES

James R. Stanford, Sugarland, and Paul G. Vogelsang, Jr., Houston, both of Tex., assignors to Nalco Chemical Company, Chicago, Ill.

Division of Ser. No. 682,618, Nov. 13, 1967, Pat. No. 3,557,001. This application Feb. 3, 1970, Ser. No. 8,436
Int. Cl. C07f 9/08; C02b 3/06
U.S. Cl. 260—928 7 Claims

Phosphate mixed esters of hydroxy amines containing less than eight carbon atoms in hydrocarbon groups attached to the amino nitrogen and hydroxy hydrocarbons containing at least six carbon atoms in a hydrocarbon group thereof are prepared and used as scale inhibitors.

3,728,420

PHOSPHATED MIXED ESTERS OF OXYALKYLATED POLYOLS AND MONOHYDRIC SURFACE ACTIVE COMPOUNDS

James R. Stanford, and Paul G. Vogelsang, Jr., both of Houston, Tex., assignors to Nalco Chemical Company, Chicago, Ill.

Division of Ser. No. 584,672, Oct. 6, 1966, Pat. No. 3,502,587. This application Dec. 9, 1969, Ser. No. 883,638The portion of the term of this patent subsequent to March 24, 1987, has been disclaimed.
Int. Cl. C07f 9/08; C02b 1/18
U.S. Cl. 260—950 6 Claims

At least partially water soluble phosphated mixed esters of non-surface active polyols containing at least one hydroxyethyl group and monohydric surface active compounds containing oxyethylene groups are prepared by reacting said polyols and said monohydric compounds with polyphosphoric acid or phosphorus pentoxide at temperatures of 50°C. to 175°C. The products are useful as scale inhibitors in hard waters and are especially useful in squeeze-type operation in oil recovery systems where the chemical must be adsorbed on the underground formation in such a manner that it is slowly released into the water as it passes over the formation.

3,728,421

PREPARATION OF METAL OXIDE GRAINS

Arend Jaman Noothout, Oosterbeek, Netherlands, assignor to Reactor Centrum Nederland, The Hague, Netherlands

Filed Dec. 8, 1970, Ser. No. 96,282
Claims priority, application Netherlands, Dec. 9, 1969, 6918435
Int. Cl. C09k 3/04
U.S. Cl. 264—0.5 10 Claims

A method is disclosed of preparing spherical particles of metal oxide hydrate and metal oxide hydrate with carbon, which particles can be converted into spherical oxide, and if carbon has been incorporated, into carbide particles.

Spherical oxides and carbides of actinide metals are used as fissile material in nuclear technics.

An aqueous solution of a metal salt is mixed at a low temperature with one or more ammonia liberating agents and subsequently solidified by dispersion in a phase of high temperature non-miscible with water, after which the solid substance obtained is separated, washed and subjected to thermal treatment.

3,728,422

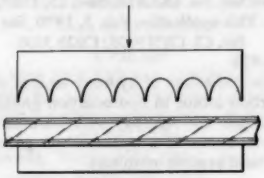
METHOD OF MAKING AN IMAGE TRANSMITTING DEVICE

Fumio Sugaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 17, 1971, Ser. No. 209,211
Claims priority, application Japan, Dec. 17, 1970, 45/113925
Int. Cl. B29d 11/00
U.S. Cl. 264—1 4 Claims

A method of forming an image transmitting device by forming a sandwich structure comprising a center of a first film

having a high refractive index and a low melting point sandwiched between two second films having a low refractive index and a medium melting point, the center being sandwiched between two third filmshaving a high melting point.



The sandwich structure is heated and pressed in a grooved mold such that the first film forms columns surrounded by the second film. The pressed sandwich structures may then be stacked and cut.

3,728,423

MATCHING THE VOLUME SHRINKAGE OF ORGANIC FIBERS TO THAT OF THE RESIN MATRIX IN CARBON OR GRAPHITE COMPOSITES

Robert C. Shaffer, Playa Del Rey, Calif., assignor to Hitco

Filed March 30, 1972, Ser. No. 239,722

Int. Cl. C04b *35/52, 35/54, 35/72*

U.S. Cl. 264—29 **9 Claims**

Organic fibers are partially carbonized to match their volume shrinkage upon complete carbonization to that of the resin matrix. Improved carbonized composite parts are manufactured with high reliability and low failure rates despite high adhesion between initially partially carbonized fiber surfaces and encompassing matrix resins during temperature cycling occurring in processing. Partially carbonized fibers having active surface components are firmly adhered to matrices comprising flexible but self-supporting thermosetting resin materials of carbonizable character. A composite part of complex shape and thin wall sections may be formed from these materials by molding under pressure and temperature. The flexible characteristic of the resin is maintained through the molding phase and permits differential shrinkage to occur without fabric-resin separation. The molded part is however self supporting and the resin matrix may thereafter be partially carbonized at an appropriate temperature level. Following this the entire part may be graphitized at an elevated temperature in an inert atmosphere, followed by infiltration and reimpregnation if desired.

3,728,424

METHOD OF MAKING FLAT CABLES

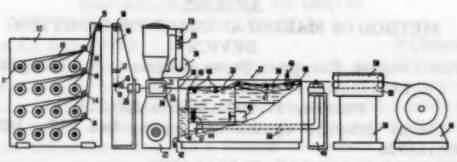
Ralf Rudiger Bauer, Baden-Wuerttemberg, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,563

Claims priority, application Germany, Aug. 22, 1969, P 19 42 784.0

Int. Cl. B29f *3/10;* **B29c** *25/00*

U.S. Cl. 264—40 **5 Claims**



Method of making flat cables with plastics by extrusion. For cooling, at least two cooling zones are provided. The width of the flat cable is adjusted by setting the temperature difference of the cooling zone, in which the cable sets, and of the preceding cooling zone.

3,728,425

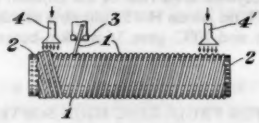
PROCESS FOR POTTING HOLLOW FIBER MEMBRANES

Paul G. Schrader, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1968, Ser. No. 731,614

Int. Cl. B29d *7/20, 27/00;* **D01f** *3/40*

U.S. Cl. 264—49 **11 Claims**



An improved method for potting plasticized, acetylated cellulose hollow fibers is disclosed wherein an improved bond between the cured resin and the fiber results when the resin comprises a polyepoxide resin, from 6 to 100 phr of an aromatic amine and from 0.5 to 5 phr of a thixotropic agent. The thixotropic agent imparts desirable application characteristics to the uncured resin and, particularly, minimizes wicking.

3,728,426

METHOD OF AND APPARATUS FOR MAKING HOLLOW ARTICLES

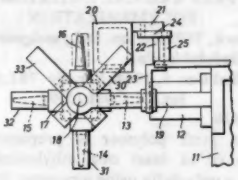
Stefan Fischer, Im Korresgarten 21, Lohmar, Germany

Filed Sept. 28, 1970, Ser. No. 76,656

Claims priority, application Germany, Sept. 27, 1961, P 19 48 978.2

Int. Cl. B29c *17/07*

U.S. Cl. 264—97 **8 Claims**



A method and apparatus for producing hollow thermoplastic articles, especially bottles. Pre-mouldings are formed by injection moulding and are transferred to a blow mould for shaping into the desired articles. Chamber or protective zone means are provided for screening the pre-mouldings from external influences as they are removed from the injection mold and transferred to the blow mould.

3,728,427

ELECTRICALLY CONDUCTIVE RESINOUS STRUCTURAL MATERIAL AND METHOD FOR ITS PREPARATION

Clinton D. Thompson, Providence, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.

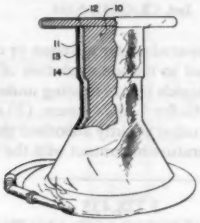
Filed Nov. 17, 1970, Ser. No. 90,310

Int. Cl. B29c *24/00;* **B32b** *5/16*

U.S. Cl. 264—101 **4 Claims**

A structural material having an electrically conductive surface is presented along with a method for its preparation. The material is particularly useful wherever it is desirable to eliminate the danger of electro-static sparks or other electrical conduction along the material's surface. The material is

resinous in character, can be reinforced, and is prepared by coating a mandrel with a resinous gel, depositing conductive metal slivers, flakes or needles upon it before it cures, applying glass cloth, applying pressure to the cloth, slivers and gel while the gel cures to force the slivers to the surface against mandrel and then removing the material from the mandrel after it has cured.



3,728,428

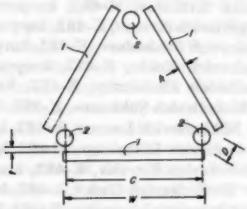
PROCESS FOR PRODUCING HOLLOW FILAMENTS

Garland L. Turner, Chesterfield County, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 881,806, Dec. 3, 1969, Pat. No. 3,635,641. This application June 10, 1971, Ser. No. 151,749

Int. Cl. B28h *21/54*; B29f *3/00*

U.S. Cl. 264—177 F 1 Claim



A spinnerette for spinning hollow filaments having a maximum amount of hollow space in relation to the outer dimensions of said filaments. The filaments are extruded from a group of preferably three slots and corresponding three round openings or dots. The polymer occluding area defined by the arrangement of the slots forms substantially an equilateral triangle. The round openings are arranged near or at the ends of the slots, but not in communication with the slots. Filaments melt spun from the nested embodiment of this spinnerette consistently have above 35 percent hollow space. The spinnerette is much less subject to breakage than similar designs. Specific parameters for spinning with such as orifice configuration are set forth.

3,728,429

SLUSH MOLDING PROCESS

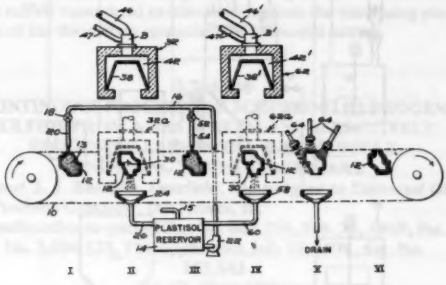
Daniel E. Colby, Somersworth; Philip E. Rogers, Dover, and Frederick J. Sliwinski, Rochester, all of N.H., assignors to McCord Corporation, Detroit, Mich.

Continuation of Ser. No. 756,178, July 29, 1968, abandoned. This application Aug. 27, 1970, Ser. No. 67,631

Int. Cl. B29c *5/12*

U.S. Cl. 264—302 9 Claims

A process for slush molding hollow thin-walled flexible plastisol articles which begins with the application of an initial thin coating of liquid plastisol to the interior surface of a cooled open mold. This initial coating is then gelled by impinging pressurized hot gas directly onto the exterior surface of the mold, preferably while the mold is inverted and rocking about a horizontal axis. Thereafter, the thickness of this initially gelled coating is increased by applying additional liquid plastisol to the interior surface of the mold, which additional plastisol is then gelled by the latent heat stored in the mold wall during the previous heating step. The entire gelled plastisol coating is finally fused by a second impingement of pressurized hot gas directly onto both the exterior mold surface and the plastisol coating on the interior mold surface, while the mold is rotating about a horizontal axis.



3,728,430

METHOD FOR PROCESSING COPPER VALUES

Jay B. Clitheroe, Salt Lake City, Utah, and Forrest H. Lacy, Jr., Houston, Tex., assignors to The Anlin Company of New Jersey, Houston, Tex.

Filed Dec. 14, 1970, Ser. No. 97,851

Int. Cl. C01g *3/12*; C22b *15/08*

U.S. Cl. 423—26 4 Claims

The steps of leaching copper values from oxide ores, mixed sulfide-oxide ores, and other oxide copper bearing materials in an aqueous medium or suspension containing soluble sulfites or bisulfites and precipitating the copper as copper sulfide in an aqueous medium or suspension containing elemental sulfur and soluble sulfites or bisulfites. The precipitated copper, along with any other copper present as elemental copper or copper sulfide, is then separated by conventional methods.

3,728,431

PRODUCTION OF TITANYL SULFATE SOLUTIONS

Gerhard Kienast; Heribert Stutgens, and Hans-Gunter Zander, all of Krefeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed March 17, 1971, Ser. No. 125,153

Claims priority, application Germany, March 28, 1970, P 20 15 155.7

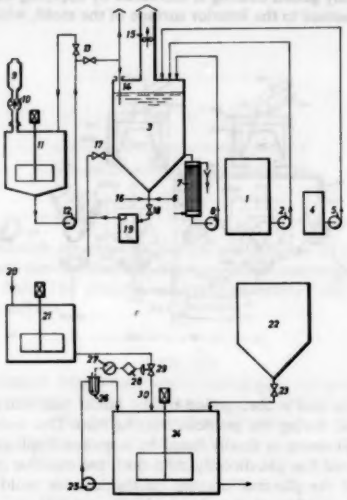
Int. Cl. C01g *23/00*, *23/04*

U.S. Cl. 423—69 6 Claims

A titanium- and iron-containing slag is ground, the iron is magnetically separated and the balance is decomposed with sulfuric acid to produce a titanyl sulfate solution which is further treated to render it suitable for preparation of superior titanium dioxide pigments.

Specifically, a portion of the ultimate titanyl sulfate solution is subjected to reduction by the addition thereto of magnetically separated iron and sulfuric acid, the reduction being carried out to give a titanium(III)content of about 50 to 90 grams per liter calculated as TiO_2. This reduced solution is added to the titanyl sulfate solution produced by sulfuric acid decomposition of the relatively iron-free slag, their relative propor-

tions being such as to provide a titanium (III) content of 0.1 to 4 grams per liter calculated as TiO_2. This prevents formation of trivalent iron which would pose a problem during later



production of pigment. A portion of the resultant solution is then recycled for reduction of titanium IV to titanium (III) by additional iron and sulfuric acid.

3,728,432

PURIFICATION OF SODIUM ALUMINATE SOLUTIONS

Marc Petitjean, Marseille Ile, and Georges Rollet, Marseille, both of France, assignors to Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 660,914, Aug. 16, 1967, abandoned. This application Aug. 24, 1970, Ser. No. 66,593

Claims priority, application France, Aug. 18, 1966, 6673427

Int. Cl. C01k *7/02*

U.S. Cl. 423—121 **10 Claims**

Solutions of sodium aluminate obtained by the alkaline treatment of bauxite ores are purified by the removal of dissolved iron therefrom through the placing of these solutions in contact with granular bauxite ores. The contacting of solutions of sodium aluminate with granular bauxite ore causes the rapid decomposition of dissolved iron and precipitation of the resultant iron oxide on the bauxite grains.

3,728,433

CONTINUOUS PROCESS FOR SCRUBBING SULFUR DIOXIDE FROM A GAS STREAM

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 9,894, Feb. 9, 1970, Pat. No. 3,574,097. This application March 26, 1971, Ser. No. 128,428. The portion of the term of this patent subsequent to April 6, 1988, has been disclaimed.

Int. Cl. C01b *17/16*

U.S. Cl. 423—242 **21 Claims**

An input gas stream containing SO_2 is continuously treated in order to remove a substantial portion of the SO_2 therefrom by the steps of: (a) scrubbing the input gas stream with an aqueous absorbent containing an alkaline reagent; (b) treating the resulting rich absorbent stream with a reducing agent at conditions selected to convert the sulfite compound contained therein to the corresponding thiosulfate compound; (c) reacting the resulting thiosulfate compound with carbon monixide at reduction conditions selected to produce the corresponding sulfide compound; (d) stripping hydrogan sulfide from the resulting solution to form a regenerated aqueous absorbent stream; and, thereafter, (e) passing at least a portion of the regenerated absorbent stream to the scrubbing step.

3,728,434

TREATMENT OF METAL HYDRIDES

Robert N. Sanders, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 6, 1968, Ser. No. 707,360

Int. Cl. C01b *6/04*

U.S. Cl. 423—274 **11 Claims**

Metal hydrides prepared under nitrogen or other highly adsorbed gas are treated to reduce evolution of such gas upon slurrying with inert liquids by (1) heating under reduced pressure to 100° to 200° C. for 1 to 24 hours, (2) contacting with helium, hydrogen or other slightly adsorbed gas and (3) cooling to ambient temperature in contact with the latter gas.

3,728,435

FLUORINATION OF BORIC ACID AND PHOSPHOROUS ACID

Robert A. Wiesboeck, Stone Mountain, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 60,147, July 31, 1970, Pat. No. 3,635,673. This application Sept. 27, 1971, Ser. No. 184,202

Int. Cl. C01b *25/10*

U.S. Cl. 423—301 **8 Claims**

A method of producing boron trifluoride or phosphorus trifluoride using a metal fluorosulfonate fluoride, $MF(FSO_3)$, as the fluorinating agent is disclosed. Boric acid, H_3BO_3, and phosphorous acid, H_3PO_3, respectively, are employed as the boron or phosphorous source.

3,728,436

METHOD OF OBTAINING SILICON MONOXIDE

Vadim Sergeevich Krikorov, K-482, korpus 347, kv. 30; Vladimir Grigorievich Krasov, K-482, korpus 447, kv. 118; Boris Alexandrovich Sukhodaev, K-482, korpus 349, kv. 9; Vilaly Kazimirovich Kokin, K-482, korpus 320, kv. 36; Valentin Danilovich Zhelninsky, K-482, korpus 328, kv. 112; Nikolai Mefodievich Sukhanov, K-482, korpus 318, kv. 81; Gennady Mikhailovich Leonov, K-482, korpus 405, kv. 113; Nikolai Ivanovich Likholetov, K-482, korpus 321, kv. 159; Igor Tikhonovich Kovalev, K-482, korpus 338-a, kv. 52; Vladimir Vladimirovich Gusev, k-482, korpus 337, kv. 15, and Andrei Petrovich Medvedev, K-482, korpus 305, kv. 66, all of Moscow, U.S.S.R.

Continuation of Ser. No. 748,904, July 31, 1968, abandoned. This application Nov. 9, 1970, Ser. No. 88,153

Int. Cl. C01b *33/00*

U.S. Cl. 423—325 **5 Claims**

A method for obtaining silicon monoxide comprising mixing finely divided polycrystalline silicon particles with amorphous silicon dioxide in a molar ratio of polycrystalline silicon particles to the amorphous silicon dioxide of 1,1 – 1.2:1 whereafter the mixture is sintered at a temperature of 1,250° – 1,400° C. in air for 2–2.5 hours, after which the mixture is subjected to a heat treatment wherein after crushing the mixture, it is subjected to a temperature of 1,350° – 1,400° C in vacuo for 1–2 hours. Silicon monoxide is removed from the vacuum chamber and is of high quality for use in electronics, optics, illumination devices and radio equipment.

3,728,437

CARBON BLACK PRODUCTION

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

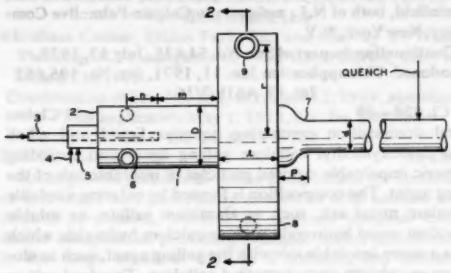
Filed Feb. 16, 1971, Ser. No. 115,539

Int. Cl. C09c *1/50*

U.S. Cl. 423—450 **8 Claims**

Method and apparatus for producing carbon black in which a first mass of hot combustion gases containing hydrocarbon feed is passed centrally and counter currently to a second mass of hot helically-flowing combustion gases whereby the

hydrocarbon feed is pyrolytically decomposed to carbon black which is removed from the downstream end of the reactor and



a portion of the hot combustion gases substantially free of carbon black are removed through ports in the upstream end of the reactor.

3,728,438

METHOD OF PRODUCING POTASSIUM SULPHATE FROM ALKALI METAL SULPHATES OR THEIR MIXTURES WITH CARBONATES

Gakif Zakirovich Nasyrov, prospekt Nauki, 12, kv. 49, Leningrad, U.S.S.R.

Filed Sept. 3, 1970, Ser. No. 69,447
Int. Cl. C01d *5/00, 1/04*
U.S. Cl. 423—551 **3 Claims**

A method of producing potassium sulphate from alkali metal sulphates or their mixtures with carbonates wherein the sulphates or their mixtures with carbonates are treated with a solution of potassium hydroxide followed by isolating the potassium sulfate product. The present method is preferably carried out by employing a counterflow continuous flow scheme involving not less than two treatments of the sulphates with alkaline solutions, and after each alkaline treatment, the mother liquor, which is essentially a mixture of alkali hydroxides, is separated from the residue obtained, the first treatment of the sulphates being carried out with the mother liquor obtained in the course of the second alkali treatment and further each treatment of the sulphates being carried out with the mother liquors obtained in each subsequent treatment, the last treatment of the sulphates being carried out with a solution of potassium hydroxide, followed by isolating the potassium sulfate product. The present method finds application in the complex treatment of alunite, natural sulphates, in treating soda-sulphate wastes of alumina production, etc.

3,728,439

TREATMENT OF A SULFITE CONTAINING AQUEOUS STEAM TO SELECTIVELY PRODUCE ELEMENTAL SULFUR

Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 5, 1970, Ser. No. 87,393
Int. Cl. C01b *17/02*
U.S. Cl. 423—567 **20 Claims**

An input water stream containing a water-soluble sulfite compound is treated to produce elemental sulfur, while minimizing the formation of undesired sulfate by-products by the steps of: (a) selectively converting the sulfite compound to the corresponding thiosulfate compound; (b) reacting a portion of the resulting thiosulfate-containing stream with a reducing agent to form a sulfide-containing stream; (c) reacting the remaining portion of the thiosulfate-containing stream with the sulfide-containing stream to form the corresponding polysulfide compound; and thereafter, subjecting the resulting stream containing the polysulfide compound to decomposition conditions selected to form elemental sulfur, hydrogen sulfide, and a substantially sulfate-free treated water stream. The principal utility of this treatment procedure is associated with the clean up, or regeneration, of sulfite-containing aqueous streams such as are produced by contacting SO_2 -containing flue gas with a suitable aqueous absorbent stream. Key features of this process are the selective conversion of the sulfite compound to the corresponding thiosulfate compound, the subsequent reduction of a portion of this thiosulfate compound to the corresponding sulfide compound and the use of this sulfide compound to selectively reduce the remaining portion of the thiosulfate compound to elemental sulfur.

3,728,440

CONTINUOUS PROCESS FOR SCRUBBING HYDROGEN SULFIDE FROM A GAS STREAM AND SELECTIVELY PRODUCING ELEMENTAL SULFUR WHILE MINIMIZING THIOSULFATE MAKE

Robert J. J. Hamblin, Deerfield, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 802,356, Feb. 26, 1969, Pat. No. 3,594,125. This application July 19, 1971, Ser. No. 163,843
Int. Cl. C01b *17/04*
U.S. Cl. 423—573 **18 Claims**

H_2S is removed from a gas stream and sulfur is selectively produced by the steps of: (1) sequentially scrubbing the gas stream with a first recycle water stream containing NH_4OH and then with a second recycle water stream which is substantially free of any NH_4OH to produce a treated gas stream which is reduced H_2S content and is substantially free of NH_3 and a rich absorbent stream containing NH_4HS; (2) catalytically reacting a portion of the rich absorbent stream and a third recycle water stream containing ammonium polysulfide and NH_4HS with a first air stream to produce an effluent stream containing ammonium polysulfide; (3) catalytically reacting the resulting ammonium polysulfide-containing liquid stream with a second air stream at oxidizing conditions effective to produce liquid sulfur and a substantially sulfide-free water stream containing NH_4OH and a minor amount of $(NH_4)_2SO_4$ (4) stripping NH_3 from at least a portion of this last water stream in order to produce a water stream which is sbustantially free of ammonium and sulfide; (5) separately recycling a portion of the water stream formed in step (3) as a portion of the first recycle water stream and a portion of the water stream formed in step (4) as the second recycle water steram to the scrubbing step; and, (6) reacting another portion of the water stream formed in steps (4) with another portion of the rich absorbent stream at thiosulfate reduction conditions to form at least a portion of the third recycle water stream and passing same to step (2).

3,728,441

REMOVAL AND RECOVERY OF SULFUR FROM A GAS STREAM CONTAINING HYDROGEN SULFIDE

Robert J. J. Hamblin, Deerfield, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 802,356, Feb. 26, 1969, Pat. No. 3,594,125. This application July 19, 1971, Ser. No. 163,844
Int. Cl. C01b *17/04*
U.S. Cl. 423—573 **11 Claims**

H_2S is removed from a gas stream and sulfur is produced by the steps of: (1) sequentially scrubbing the gas stream with a first recycle water stream containing NH_4OH and then with a second recycle water stream which is sbustantially free of NH_4OH to produce a treated gas stream which is reduced in H_2S content and is substantially free of NH_3 and a bottom water stream containing NH_4HS; (2) catalytically treating the bottom water stream with an air stream to produce an effluent stream containing ammonium polysulfide; (3) treating the ammonium polysulfide-containing stream to recover sulfur and to produce a water stream which is substantially free of NH_4OH and a water stream containing NH_4OH; and, (4) separately recycling at least a portion of these last two streams to the scrubbing step.

3,728,442

METHOD OF PRODUCING VANADIUM PENTOXIDE

Dmitry Afanasievich Pakhomov, ulitsa D. Bednogo, 58a, kv. 46; Stanislav Mikhailovich Arkhipov, ulitsa Koshurnikova, 12, kv. 81; Alexandr Egorovich Pruntsev, ulitsa D. Bednogo, 58, kv. 23; Semen Avramovich Milsky, ulitsa D. Bednogo, 58a, kv. 21, and Alexei Petrovich Pleskachev, ulitsa D. Bednogo, 58, kv. 31, all of Novosibirsk, U.S.S.R.

Filed June 7, 1971, Ser. No. 150,791
Int. Cl. C01g *31/00*
U.S. Cl. 423—592 6 Claims

A method of producing vanadium pentoxide, characterized in that ammonium vanadate is treated with a 2.0 – 2.5 N. mineral acid at a H^+/VO_3^- ratio = 1.0 – 1.1 g-equiv. The resultant vanadium acid precipitate is separated from the mother liquor, washed with water to the pH value of the washings equal to 4 – 5 and calcined at a temperature of 500° – 600° C.

The proposed method makes possible the production of a granulated dustless final product of a high degree of purity.

3,728,443

PRODUCTION OF HIGH ASPECT RATIO ACICULAR RUTLE TIO

Robert Berisford, and Eric P. Joinson, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 14, 1971, Ser. No. 180,449
Int. Cl. C01g *23/04*, *33/08*; B01d *9/00*
U.S. Cl. 423—610 5 Claims

TiO_2 fibers are produced in the form of single acicular rutile crystals from a calcined blend of TiO_2, salt and oxy-phosphorus components. High aspect ratio fibers are achieved by the use of water in the blend and critical control of the ratios of the solid components.

3,728,444

METHOD AND COMPOSITIONS FOR INDUCING RESISTANCE TO BACTERIAL INFECTIONS

Elton S. Cook, and Kinji Tanaka, both of Cincinnati, Ohio, assignors to Stanley Drug Products, Inc., Portland, Oreg.

Filed April 28, 1971, Ser. No. 138,331
Int. Cl. A61k *27/00*
U.S. Cl. 424—315 1 Claim

A variety of substances are reported which alter host resistance to cocci and bacilli bacterial infections. Nevertheless, because of the extreme difficulty of total eradication, and the frequent reappearance of the same strains even after their apparently successful elimination, there is a continuing need for drugs for the treatment of coccic infections. Some amino sulfonic acids have been found effective in inducing resistance to infections due to cocci and bacilli.

3,728,445

CONTROLLED RELEASE MEDICAMENT

Frank M. Bardani, Rye, N.Y., assignor to Controlled Medications Limited, Calgary, Alberta, Canada

Filed Oct. 19, 1970, Ser. No. 82,548
Claims priority, application Great Britain, Sept. 28, 1970, 46086/70
Int. Cl. A61k *27/12*
U.S. Cl. 424—22 12 Claims

The invention relates to novel extended-release medicament preparations, particularly in tablet form, and to a method of preparing same. The preparations of the invention are based on the desired medicament, an excipient such as a sugar, a defined class of binder and a "barrier" salt such as magnesium stearate.

3,728,446

SPECKLED DENTIFRICE GEL

Francis D. Roberts, West Millington, and James Norfleet, Plainfield, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 54,635, July 13, 1970, abandoned. This application Jan. 11, 1971, Ser. No. 105,652
Int. Cl. A61k *7/16*
U.S. Cl. 424—49 11 Claims

Oral composition containing aqueous liquid and alkali metal carboxymethyl cellulose gelling agent and including non-toxic impalpable colored particles of insoluble salt of the gelling agent. The composition is formed by coloring a soluble polyvalent metal salt, such as aluminum sulfate, or soluble polyvalent metal hydroxide such as calcium hydroxide which forms a water-insoluble salt with the gelling agent, such as aluminum or calcium carboxymethyl cellulose. The dyed salt or hydroxide is then incorporated into the oral composition thereby forming non-toxic impalpable particles of the insoluble salt of the metal with the gelling agent. The speckled dentifrice may also be formed by first incorporating the metal salt or hydroxide into a dyed dentifrice gel thus permitting dye from the gel to become adsorbed into the thereby formed particles, or by incorporating the metal salt or hydroxide into an uncolored gel thereby forming particles which are themselves colored or are then dyed.

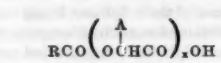
3,728,447

FATTY ACID LACTYLATES AND GLYCOLATES FOR CONDITIONING HAIR

Lloyd Osipow, New York, N.Y., and Dorothea Marra, Summit, N.J., assignors to C. J. Patterson Company, Kansas City, Mo.

Continuation-in-part of Ser. No. 464,825, June 17, 1965, abandoned. This application March 3, 1970, Ser. No. 16,230
Int. Cl. A61k *7/06*
U.S. Cl. 424—70 16 Claims

Agents containing fatty acid lactylates and glycolates of the formula



wherein RCO is the acyl radical of a fatty acid of from six to 22 carbon atoms, A is either CH_3 or H and x is a number from about one to four and their ammonium, alkali metal and physiologically acceptable amine salts are used for conditioning hair, that is, for improving the texture and manageability as well as curl or wave retention of the hair.

3,728,448

ANTIBIOTIC BL617 AND PROCESS FOR PRODUCING SAME

Martin Paul Kunstmann, Pearl River, N.Y.; Charles Brainerd Williamson, III, Gainesville, Fla., and John Norman Porter, Ramsey, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed April 6, 1971, Ser. No. 131,745
Int. Cl. A61k *21/00*
U.S. Cl. 424—121 4 Claims

This disclosure describes a new antibiotic, designated BL617, produced in a microbiological fermentation under controlled conditions using a strain of *Streptomyces luteoverticillatus*. The new antibiotic is active against a variety of microorganisms including fungi and thus is useful in inhibiting the growth of such microorganisms wherever they may be found.

3,728,449
GERMICIDAL IODINE COMPOSITIONS FOR APPLICATION TO SKIN TISSUE INCLUDING TEATS OF MILK ANIMALS

Abraham Cantor, Elkins Park, Pa., and Murray W. Winicov, Flushing, N.Y., assignors to West Laboratories, Inc., Long Island City, N.Y.

Continuation of Ser. No. 832,482, June 11, 1969, abandoned. This application May 1, 1972, Ser. No. 249,096
Int. Cl. A61k *27/00*
U.S. Cl. 424—150 **12 Claims**

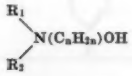
An improved germicidal-iodine composition for application to skin tissue and particularly to teats of milk animals in the control of mastitis, wherein an aqueous nonionic carrier-iodine composition providing available iodine concentration in the range of about 0.25 to 2 percent, and containing nonionic carriers of the types which have been cleared for use in contact with food equipment in an amount providing a ratio of carrier to available iodine within the range of 5:1 to 20:1, is supplemented by an emollient in the form of a water-soluble polyhydric alcohol or ethoxylated lanolin, and the emollient is protected against reaction with the iodine by providing a suitably high distribution coefficient for the iodine and maintaining a pH in the composition in the range of about pH 3 – 6.5, and preferably buffered at about pH 3.5 – 4.5. Buffering can be effected by various food acids and salts of food acids.

3,728,450
INOSINE DERIVATIVES

Paul Gordon, Chicago, Ill., assignor to Newport Pharmaceuticals, Inc., Newport, Calif.

Division of Ser. No. 853,864, Aug. 28, 1969, Pat. No. 3,645,007. This application May 21, 1971, Ser. No. 145,929
Int. Cl. A61k *25/00*
U.S. Cl. 424—180 **9 Claims**

Complexes are formed in inosine and amino-alcohols of the formula



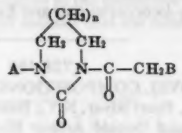
where R_1 and R_2 are lower alkyl and n is an integer of 2 to 4 The complexes having pharmacological activity including the ability to restore deteriorated learning and memory behavior. The preferred aminoalcohol is dimethylamino isopropanol. The preferred ratio of inosine to aminoalcohol is 1:3.

3,728,451
CYCLIC UREA AMIDE PHOSPHATES USEFUL AS INSECTICIDES

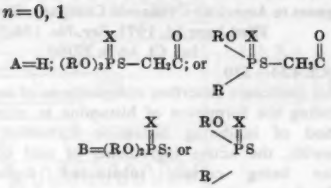
Peter E. Newallis, Overland Park, Kans., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 694,418, Dec. 29, 1967, Pat. No. 3,629,280. This application Aug. 12, 1970, Ser. No. 63,269
Int. Cl. A01n *9/22, 9/36*
U.S. Cl. 424—200 **8 Claims**

A new class of cyclic urea amide phosphates and phosphonates, utilized as insecticides, and having the following general structure covering the compounds of this invention:



wherein $n=0, 1$



and wherein R = lower alkyl group having 1–5 carbon atoms; $X = O$ or S.

3,728,452
WATER-SOLUBLE COMPOSITION COMPRISING SULFADIMIDINE AND PYRIMETHAMINE

Raphael Ralph G. Haber, and Eva Schoenberger, both of Givatayim, Israel, assignors to Abic Ltd., Ramat-Gan, Israel

Filed Jan. 20, 1971, Ser. No. 108,231
Int. Cl. A61k *27/00*
U.S. Cl. 424—229 **6 Claims**

The present invention relates to a water-soluble composition of N(4,6-dimethyl-2-pyrimidinyl)sulfanilamide (hereinafter called "sulfadimidine") and 2,4-diamino-5-chlorophenyl-6-ethyl-pyrimidine (hereinafter called "-pyrimethamine") solubilized with glycols. for oral administration to animals in the form of an aqueous solution thereof, said composition comprising free sulfadimidine and free pyrimethamine both dissolved in a water miscible organic solvent selected from the group consisting of propylene glycol, tetrahydrofurfurylethyleneglycol ether, polyethylene glycol, and methylidene glycerol, and mixtures thereof, the ratio of pyrimethamine: sulfadimidine being between 1:20 to 1:4 by weight.

3,728,453
DIALURIC ACID COMPOUNDS AS ANTIBACTERIAL AND ANTIFUNGAL AGENTS

John D. Douros, Jr., and Al Fred Kerst, both of Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 6, 1970, Ser. No. 75,310
Int. Cl. A01n *9/00, 9/22*
U.S. Cl. 424—251 **23 Claims**

Dialuric acid and dialuric acid monohydrate can be used to inhibit and/or prevent the growth of undesirable herbs, bacteria, fungi, yeast, and other microorganisms. This invention is particularly concerned with the bacteriostatic and bactericidal properties of dialuric acid compounds against *Staphylococcus aureus*, *Escherichia coli*, and *Xanthomonas phaseoli*.

3,728,454
ALLOXAN COMPOUNDS AS ANTIBACTERIAL AND ANTIFUNGAL AGENTS

John D. Douros, Jr., and Al Fred Kerst, both of Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 14, 1970, Ser. No. 75,311
Int. Cl. A01n *9/00, 9/22*
U.S. Cl. 424—251 **24 Claims**

Alloxan, alloxan monohydrate, and alloxan tetrahydrate can be used to inhibit and/or prevent the growth of undesira-

ble herbs, bacteria, fungi, yeast, and other microorganisms. This invention is particularly concerned with the bacteriostatic and bactericidal properties of alloxan compounds against *Staphy-lococcus aureus* and *Escherichia coli*.

3,728,455

NOVEL COMPOSITIONS OF MATTER

David Kupfer, Pearl River, N.Y.; Henry George Roscoe, Montvale, N.J., and Donald Arthur Blickens, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 24, 1971, Ser. No. 156,512
Int. Cl. A61k 27/00
U.S. Cl. 424—270 5 Claims

This disclosure describes compositions of matter useful for inhibiting the formation of histamine in mammals and the method of inhibiting histamine formation in mammals therewith, the active ingredients of said compositions of matter being certain substituted 4-phenyl-2-mercaptothiazoles.

3,728,456

FUNGICIDAL COMPOSITIONS AND METHODS OF COMBATING FUNGI USING PHTHALIMIDOMETHYL ISOTHIOCYANATE

Gerhard Zumach; Bertram Anders, both of Cologne-Stammheim; Ferdinand Grewe, Burscheid; Engelbert Kuhle, Berg. Gladbach, and Helmut Knapers, Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 729,547, May 16, 1968, Pat. No. 3,558,650. This application Oct. 21, 1970, Ser. No. 82,827
Claims priority, application Germany, June 13, 1967, F 52666
Int. Cl. A01n 9/22
U.S. Cl. 424—274 5 Claims

Phthalimidomethyl isothiocyanate which possesses fungicidal properties and which may be produced by reacting the corresponding N-chloromethyl-phthalimide, optionally in the presence of a solvent, with a compound which donates the thiocyanate group, e.g., trimethylsilyl isothiocyanate, and alkali metal and ammonium thiocyanates.

3,728,457

MEDICAMENT WITH AN ANTI-INFLAMMATORY AND ANTI-ULCEROUS ACTION

Roland Yves Mauvernay, Riom, and Norbert Busch, Loubeyrat, both of France, assignors to Societe Anonyme dite: Centre Europeen de Recherches Mauvernay-Cerm, Riom, France

Filed Dec. 21, 1971, Ser. No. 210,586
Int. Cl. A61k 27/00
U.S. Cl. 424—274 4 Claims

For anti-ulcerous and anti-inflammatory treatment, a medicament is administered to a patient consisting of N-[2-phenyl-2-isoamyloxy]-ethyl-pyrrolidine. The medicament can be administered parenterally in an amount of 10 to 50 mg/day or orally in an amount of 100 to 220 mg/day or rectally in an amount of 150 to 300 mg/day.

3,728,458

METHODS OF CONTROLLING NEMATODES USING 2-BUTYL-4,6-DINITRO-PHENOL CARBOXYLIC ESTERS

Max Planka, St. Albans, England, assignor to The Murphy Chemical Company Limited, St. Albans, England

Filed July 24, 1969, Ser. No. 844,638
Claims priority, application Great Britain, July 25, 1968, 35,589/68
Int. Cl. A01n 9/00, 9/22, 9/24
U.S. Cl. 424—311 8 Claims

Nematodes and fungi in the soil may be controlled by 2-butyl-4,6-dinitrophenols and their carboxylic or carbonate esters.

3,728,459

CERTAIN N-SUBSTITUTED OCTADECADIENOIC ACID AMIDES USED TO REDUCE CHOLESTERAL LEVELS

Takashi Seki; Chiharu Saito, both of Toyonaka; Katsuyuki Toki, Nishinomiya; Keisuke Matsuka, Toyonaka; Yoshio Suzuki, Amagasaki, and Akira Kobayashi, Ikeda, all of Japan, assignors to Sumitomo Chemical Co. Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 478,758, Aug. 10, 1965, abandoned, which is a continuation-in-part of Ser. No. 342,682, Feb. 5, 1964, abandoned. This application July 13, 1970, Ser. No. 54,648
Int. Cl. A61k 27/00
U.S. Cl. 424—324 3 Claims

Method of reducing elevated level of cholesterol in blood by administering an N-substituted octadecadienoic acid amide is provided, as well as compositions containing the N-substituted octadecadienoic acid amide.

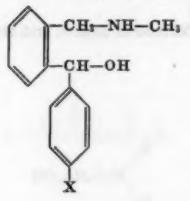
3,728,460

ANORECTIC PHARMACEUTICAL COMPOSITION CONTAINING CERTAIN α-(METHYLAMINO-METHYL)-ALPHA-(4'-HALO-PHENYL)-BENZYL ALCOHOLS AS ACTIVE INGREDIENTS

Kurt Freter, Beaconsfield; Manfred Gotz, Hudson; James T. Oliver, Beaconsfield, all of Canada, and Karl Zeile, Ingelheim/Rhine, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhine, Germany

Continuation-in-part of Ser. No. 785,750, Dec. 20, 1968, Pat. No. 3,635,974. This application July 13, 1971, Ser. No. 162,299
Int. Cl. A61k 27/00
U.S. Cl. 424—330 2 Claims

Anorectic pharmaceutical compositions containing as an active ingredient a compound of the formula



wherein *X* is chlorine or fluorine, or a non-toxic acid addition salt thereof; and a method of curbing the appetite of warm-blooded animals therewith.

3,728,461

USE OF VIOLURIC ACID AS A FUNGICIDE OR BACTERICIDE

John D. Douros, Jr., and Al F. Kerst, both of Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 31, 1970, Ser. No. 78,322
Int. Cl. A01n 9/00, 9/22
U.S. Cl. 424—251 6 Claims

Violuric acid can be used to inhibit and/or prevent the growth of many undesirable forms of algae, bacteria and fungi. This invention is particularly concerned with the algaecidal properties of violuric acid against the algae species Scenedesmus, Plectonema, Anabaena, Ankistrodesmus, Oscillatoria, Coccochloris, Chlamydomonas, Lyngbya, Synura and Chlorella. The bactericidal properties of violuric acid are especially useful in combating Xanthomonas and Erwinia species.

ELECTRICAL

3,728,462
HOLDER AND GUIDE FOR WRITING AND READING MUSIC

Verna M. Leonard, 6353 N. Blackstone, Fresno, Calif.

Continuation of Ser. No. 43,907, June 5, 1970. This application April 13, 1972, Ser. No. 243,892
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 2 Claims

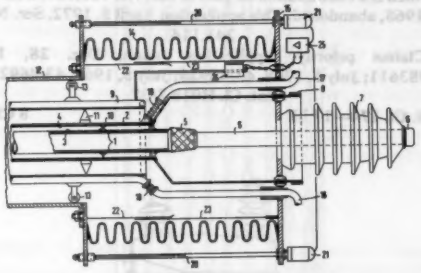
A staff paper holder and guide for semi-skilled musicians such as rock and roll devotees having musical talent but little formal music education. When placed in front of the user either on a writing surface or a music rack the left hand edge has a flap to accept an edge of staff paper and the flap has indicia thereon identifying by name the lines and spaces of the staff paper, including ledger lines, critically positioned so that juxtaposition of the staff paper with the indicia is more or less automatically achieved. The holder includes a pocket and a replaceable card with indicia thereon to guide the user in reading and playing the written music to secure a proper base beat.

3,728,463
EXPANSION AND CONTRACTION COMPENSATION ARRANGEMENT FOR SUPERCONDUCTING CABLES

Dieter Kullmann, and Fritz Schmidt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed March 3, 1972, Ser. No. 231,592
Claims priority, application Germany, March 15, 1971, P 21 12 406.1
Int. Cl. H01v *11/02;* H02g *15/02*
U.S. Cl. 174—12 R 4 Claims

A compensation arrangement for accommodating the contraction occurring in superconducting cables as they are cooled down to the operating temperature. The superconducting cable is of the type wherein the superconducting material is applied as a layer on coaxial carrier tubes of electrically normal-conducting material, and the carrier tubes are inserted into a protective tube. The cable is movably guided in the protective tube, and a cover plate is located at an end of the cable and adapted for carrying the current connections and the coolant feed lines to the cable. A corrugated tube is provided for connecting the cover plate with the protective tube. Also, the cover plate is movable relative to the protective tube by means of a servo control in such manner that the connections to the

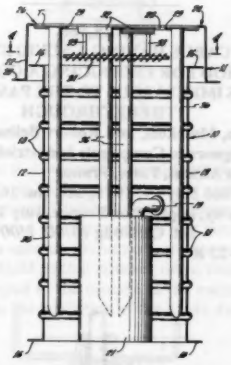


cable remain essentially free of mechanical stresses under the thermal movements that occur.

3,728,464
UNDERGROUND TRANSFORMER ENCLOSURE, AND METHOD OF INSTALLING THE SAME

Roy Griffing, 485 North State Highway, Lake Arrowhead, Calif.

Filed April 17, 1972, Ser. No. 244,463
Int. Cl. H01f *27/08;* E02d *29/04*
U.S. Cl. 174—16 R 24 Claims



The enclosure for buried transformers is formed of two separate fiberglass parts, namely a hole liner and a cover. The hole liner comprises two corresponding semicylindrical sections which are joined together and then mounted around the transformer, in vertical relationship. The cover comprises a top portion and a skirt portion, and includes depending conduits for convecting cooling air down to the bottom of the hole liner. The convected air then passes upwardly through a central opening in the top portion of the cover. In accordance with the method, earth is compacted around the hole liner, following which the cover is mounted in telescoped relationship around the upper region of the hole liner. The cover is supported on the compacted earth, not on the hole liner, which means that the cover position is readily adjusted in the event the grade changes.

3,728,465

ELECTRICAL APPARATUS WITH THERMALLY STABILIZED CELLULOSE INSULATION

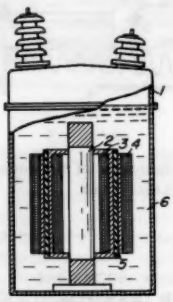
Eiji Yasui, Hitachi; Akira Miyoshi, Tamotsu Okamura, both of Tokyo, and Nobuhiko Shito, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 106,929, Jan. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 786,089, Dec. 23, 1968, abandoned. This application April 5, 1972, Ser. No. 241,114

Claims priority, application Japan, Dec. 28, 1967, 42/83611; July 5, 1968, 43/46926; July 5, 1968, 43/46927

Int. Cl. H01b 7/02

U.S. Cl. 174—17 LF 8 Claims



An electrical apparatus containing an insulating oil which is in contact with a cellulosic insulating material improved in heat resistance and stability by incorporation of a urethane compound containing at least one urethane bond and having a molecular weight of 75 to 1000.

3,728,466

COAXIAL CABLE HAVING A FLUID STOP THEREIN AND METHOD FOR PRODUCING A COAXIAL CABLE WHICH IS IMPERVIOUS TO THE PASSAGE OF AIR THERETHROUGH

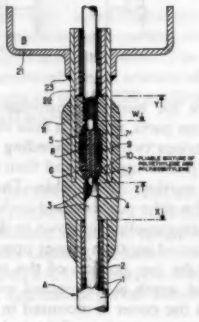
Lucien Rocton, Malakoff, and Robert Belisaire, Paris, both of France, assignors to Compagnie Industrielle des Telecommunications Cit Alcatel, Paris, France

Filed July 19, 1971, Ser. No. 163,573

Claims priority, application France, July 17, 1970, 7026551

Int. Cl. H02g 15/00, 1/00

U.S. Cl. 174—23 R 15 Claims



A method of producing a cable having an internal blocking zone which is impassable to air, thereby assuring the imperviousness of the cable at the entrance to an equipment box to which the cable is connected, the blocking zone including an internal volume surrounding the inner conductor of the cable and filled with a pliable insulating material.

3,728,467

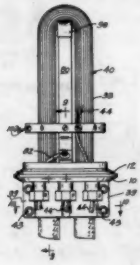
BURIED-TYPE SPLICE CASE

Milton A. Klayum, Wood Dale, and Chester E. Pierzchala, Wheaton, both of Ill., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed Nov. 9, 1971, Ser. No. 196,911

Int. Cl. H02g 9/02

U.S. Cl. 174—38 5 Claims



A buried-type ready-access splice closure comprises a dielectric base with a pair of openings for receiving the opposite runs of a loop of cable. The base is split along a parting region that passes through the centers of the openings. The base also has clamping means for clamping the runs of the cable and for grounding the shield of the cable outside of the base. The loop of cable has its coverings stripped away to expose the insulated core wires for splicing to service wires. The loop is supported by a bracket that is attached to the base and to the clamping means, and the loop and bracket are enclosed by a cover that is removably clamped to the base. Additional openings are provided in the base for receiving the service wires which may be sealed to the base by a nut and bushing arrangement. The split base permits ready substitution of another cable or extension of the cable to another location if the splice case is originally used as a dead end housing for the cable.

3,728,468

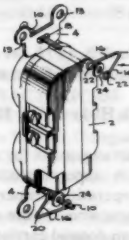
SPRING TYPE GROUNDING MEANS FOR ELECTRICAL FIXTURES

Christopher B. Grauer, 3755 Northview Drive, Jackson, Miss.

Filed Feb. 16, 1972, Ser. No. 226,690

Int. Cl. H01r 3/06

U.S. Cl. 174—51 7 Claims



A spring clip contact member is disclosed in the form of a unitary V-shaped member formed of a pair of arms connected at an apex with rounded eyelet contact terminals being formed in the ends of the arms opposite the apex. The V-shaped member is mounted on the mounting screw between the yoke

of an electrical receptacle and the receptacle mounting box to be spring biased outwardly into forcible contact with both the receptacle and the box for providing a grounding circuit between the receptacle and the grounding circuit of the box in one embodiment with a second embodiment being disclosed in which the end of one of the arms is welded to the receptacle yoke. In another embodiment, the spring contact member is formed with a rounded loop defining the apex of the V-shaped member.

3,728,469

CAVITY STRUCTURE

Frederick Rybarczk, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed March 11, 1971, Ser. No. 123,201
Int. Cl. B44d *1/02*
U.S. Cl. 174—52 S **18 Claims**

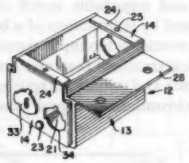
By rounding and/or rendering obtuse at least the vertical angles of the connecting walls in a ceramic cavity which come into contact with a noble metal coating or pad therein, "peel-back" of the noble metal coating or pad is prevented.

3,728,470

ELECTRICAL OUTLET BOX WITH CABLE CONNECTORS

William Maier, 125 Lawlor Terrace, Stratford, Conn.

Filed Sept. 27, 1971, Ser. No. 183,840
Int. Cl. H02g *3/16*
U.S. Cl. 174—58 **18 Claims**



An extruded box body with open ends has a bottom wall and a pair of side walls, with opposing channels formed at the inside of the side walls. A pair of separate box ends are provided with keeper members which are received and frictionally held in the channels. One of the side walls has an external mounting flange for securing the box to a supporting stud, and a keeper rib on the bottom wall of the box body is supportably engaged by a special fastener driven into the side of the stud. The box ends have knock-out plugs which when removed, leave openings to receive cable connectors. The openings have diametrically opposed recesses and the connectors have lugs which pass through the recesses and then hold the connectors in place when the latter are turned through 90°.

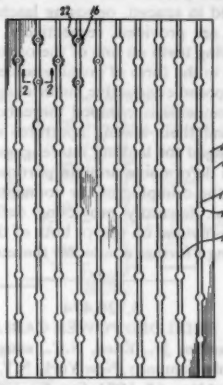
3,728,471

PRINTED CIRCUIT BOARDS WITH KNOCKOUTS

Harold L. Blinkhorn, Goshen, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 8, 1971, Ser. No. 187,661
Int. Cl. H05k *7/06*
U.S. Cl. 174—68.5 **2 Claims**

Electrically non conductive relatively flexible board has electrically conductive parallel lines printed thereon, each line having spaced circular regions with transverse bores with circular peripheral groove permitting ease of removal.

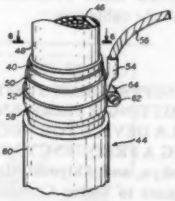


3,728,472

MECHANICAL PRESSURE TYPE ELECTRICAL CONNECTIONS FOR TERMINATING AND CONNECTING METALLIC CABLE SHIELDS

Raoul H. Leuteritz, Westfield, and Attila Dima, Piscataway, both of N.J., assignors to General Cable Corporation, New York, N.Y.

Filed March 31, 1972, Ser. No. 239,938
Int. Cl. H02g *15/08*
U.S. Cl. 174—78 **13 Claims**



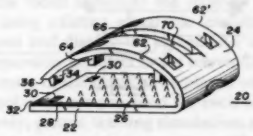
This invention is a support formed from a flat strip that is bent around electric cable and that has its ends interlocked to form a short section of tubing which is inserted between the insulation shield and the metal shield that surrounds the insulation shield. It is used at splices and other terminations to support the metal shield so that contact rings, connectors and the like can be clamped to the outside of the metal shield without exerting force on the insulation of the cable. cable.

3,728,473

MULTI-ORIFICED ELECTRICAL CONNECTOR

Lai Che Kuo, Fanwood, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 6, 1971, Ser. No. 187,076
Int. Cl. H01r *5/00*
U.S. Cl. 174—84 C **12 Claims**



A connector preferably for crimpable coupling of either bare or insulated flat conductive material such as the foil

shield of shielded cable to further conductive material and comprising a base portion and a selectively formed arcuate portion arranged in spaced, opposing latchable relationship, which portions are provided, respectively, with, in one embodiment, piercing teeth on one of the opposing surfaces and pressure means in the form of protuberances on the other for urging the interposed conductive material against the piercing teeth as the connector is crimped thereabout. One or more latching tabs and their mating apertures are provided and selectively arranged for locking interengagement as the convexedly formed deformable arcuate portion is compressively flattened upon the crimping of the connector about the conductive material. Inwardly projecting deflectable protuberances may be provided on one or both of the connector portions for coupling a further conductor thereto.

3,728,474

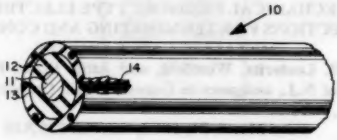
SHIELDED POWER CABLE

Edwin H. Arnaudin, Jr., Eden, N.C., assignor to Anaconda Wire and Cable Company, New York, N.Y.

Filed Nov. 15, 1971, Ser. No. 199,064

Int. Cl. H01b 9/02

U.S. Cl. 174—115 **6 Claims**



Electric power cables with semiconducting jackets have stranded or bunched drain conductors embedded in the jackets, in line with the cable axis.

3,728,475

BEAT SIGNAL SUPPRESSION SYSTEM FOR A SYSTEM FOR TRANSMITTING A FREQUENCY MODULATED WAVE OR A DEVICE FOR RECORDING AND REPRODUCING A FREQUENCY MODULATED WAVE

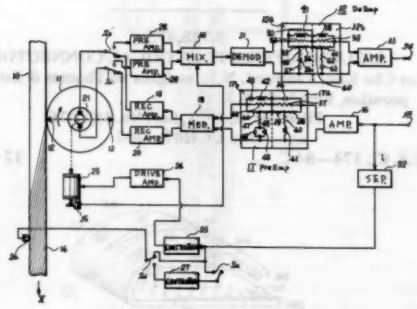
Yuzuru Inoue, Tokyo, and Akiyoshi Morita, Yokohama, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed July 6, 1970, Ser. No. 52,420

Claims priority, application Japan, July 4, 1969, 44/53177

Int. Cl. H04n 5/78; G11b 5/04

U.S. Cl. 178—5.2 R **4 Claims**



A system for transmitting or recording and reproducing a frequency modulated wave suppresses beats produced by a carrier wave and a signal component of high energy level distribution, which is disposed in a range of higher frequencies of a wave signal. A frequency component, which is liable to be reproduced as a beat signal, is subjected to pre-emphasis. A demodulated signal obtained by demodulating the frequency modulated signal is subject to deemphasis with a characteristic opposite to the pre-emphasis characteristics applied to the wave signal. Thus the frequency-phase characteristics of the signals is uniform throughout the system, whereby the influence exerted by moire beat interference on the demodulated signal can be minimized.

3,728,476

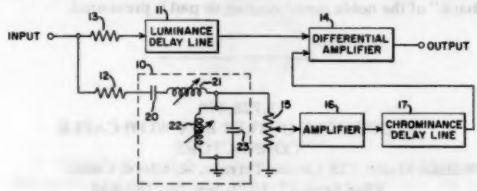
LUMINANCE NOTCH FILTER

William C. Bates, Clay, and Thomas T. True, Camillus, both of N.Y., assignors to General Electric Company

Filed March 17, 1971, Ser. No. 125,275

Int. Cl. H03h 7/04; H04n 5/14

U.S. Cl. 178—5.4 **7 Claims**



Chrominance frequency components in the luminance channel of a color television camera are reduced by a luminance channel notch filter having substantially linear phase characteristics and adjustable notch depth. The luminance notch is developed by subtraction of a bandpass-filtered video signal from the overall video input signal. The filter, which exhibits symmetrical transient response, improved low light level noise performance and minimizes spurious color effects due to interaction of chrominance signal components with the luminance signal.

3,728,477

RECORDING AND REPRODUCING COLOR PICTURE INFORMATION

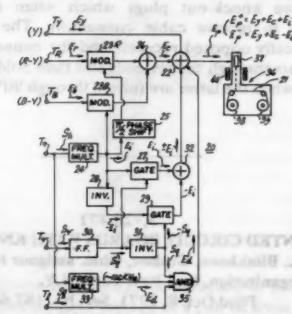
Yasuharu Kubota, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 211,918

Claims priority, application Japan, Dec. 28, 1970, 45/128495

Int. Cl. H04n 5/84, 9/00

U.S. Cl. 178—5.4 CD **37 Claims**



Successive scenes or fields of color picture information are recorded by exposing successive frames or portions of an elon-

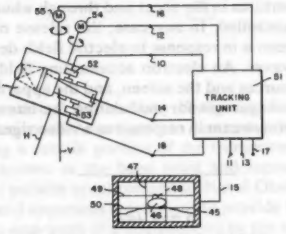
gated strip of radiant energy-sensitive record medium, for example, monochrome photographic film, to radiant energy in the form of light or an electron beam, and modulating the radiant energy for recording, in each of the frames or record medium portions information representing a composite signal which contains luminance and chrominance signals and an index signal having the same frequency as the color carrier for the chrominance signal and with the phase of either the index signal or the chrominance signal carrier, but not both, being reversed for successive color picture fields, that is in successive frames. In reproducing the recorded color picture information, the information recorded in the successive frames or record medium portions is detected to simultaneously reproduce first and second composite signals corresponding to two successive color picture fields, the chrominance and index signals are separated together from the first and second reproduced composite signals and added and subtracted to provide the chrominance signal and the index signal separate from each other, and the separated index signal is then employed to demodulate the chrominance signal and thereby provide color difference signals which, with the luminance signal separated from one of the reproduced composite signals, define a respective color picture.

3,728,478

ELECTRO-OPTICAL TRACKER

Douglas M. Turner, and Donald G. Quist, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 8, 1968, Ser. No. 727,741
Int. Cl. H04n 3/22
U.S. Cl. 178—6.8 **5 Claims**



A target adaptive television contrast tracker for missile application wherein the adaptive feature comprises a linearly weighed tracking gate, which keeps account of positive target edge information, and means for determining the width of the target to keep account of negative target edge information. The tracking gate is arranged to coincide with the positive target edge information, and the mean raster position between the positive and negative target information coincides with the center of the target.

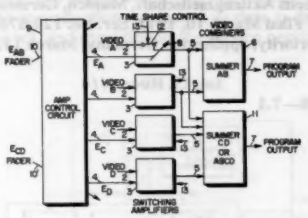
3,728,479

LOGIC CONTROL FOR VIDEO PROCESSING IN PROGRAM SWITCHERS

Nallaswamy Srinivasan, Liverpool, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,556
Int. Cl. H04n 5/22
U.S. Cl. 178—6.8 **9 Claims**

Amplitude sharing of a plurality of video signals to produce special visual effects by use of parallel arranged switching amplifiers employing digital control of gain controlling analog



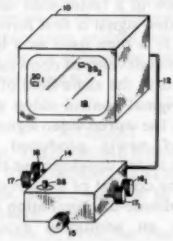
signal generating circuits.

3,728,480

TELEVISION GAMING AND TRAINING APPARATUS

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 697,798, Jan. 15, 1968, abandoned. This application March 22, 1971, Ser. No. 126,966
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 **46 Claims**



The present invention pertains to an apparatus and method, in conjunction with standard monochrome and color television receivers, for the generation, display, manipulation, and use of symbols or geometric figures upon the screen of the television receivers for the purpose of training simulation, for playing games, and for engaging in other activities by one or more participants. The invention comprises in one embodiment a control unit, connecting means and in some applications a television screen overlay mask utilized in conjunction with a standard television receiver. The control unit includes the control means, switches and electronic circuitry for the generation, manipulation and control of video signals which are to be displayed on the television screen. The connecting means couples the video signals to the receiver antenna terminals thereby using existing electronic circuits within the receiver to process and display the signals. An overlay mask which may be removably attached to the television screen may determine the nature of the game to be played or the training simulated. Control units are provided for each of the participants. Alternatively, games, training simulations and other activities may be carried out in conjunction with background and other pictorial information originated in the television receiver by commercial TV, closed-circuit TV or a CATV station.

3,728,481
METHOD FOR IMPROVING THE ACCURACY OF EVALUATING CERTAIN OBJECTS IN THE FIELD OF A RASTER SCAN

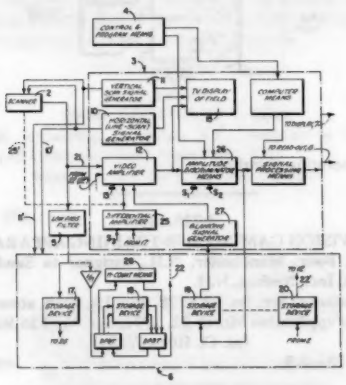
Walter Froehlich, Karlsruhe, and Walter Lang, Aalen, both of Germany, assignors to Carl Zeiss-Stiftung, Wuerttemberg and Siemens Aktiengesellschaft, Munich, Germany

Filed March 10, 1971, Ser. No. 122,675

Claims priority, application Germany, March 11, 1970, P 20 11 470.9

Int. Cl. H04n 5/14

U.S. Cl. 178—7.1 **10 Claims**



The invention contemplates a method and means for evaluating an area or other function of an object scanned within the field of view of a raster-scan device such as a TV camera. A control video signal is first formed for a complete raster and is stored. It is then used as a basic reference for creating the video signal developed upon subsequent scanning of an object or objects in the same field of view as that comprehended by the original control video signal. In the form specifically disclosed, the stored video signal is used to control the amplification of newly produced video signal, in synchronism with the raster development thereof. The invention is described in the context of area evaluation of scanned objects, wherein amplitude-discrimination techniques are relied upon to make an additional evaluation of object brightness.

3,728,482
FOCUSING

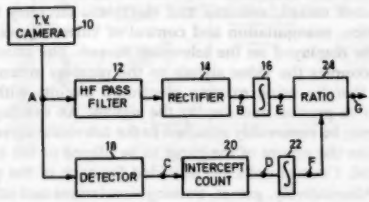
James Frank Wren, Wrestlingworth, England, assignor to Image Analysing Computers Limited, Melbourn, Royston, Hertfordshire, England

Filed Nov. 5, 1970, Ser. No. 87,107

Claims priority, application Great Britain, Nov. 5, 1969, 54,114/69

Int. Cl. H04n 5/26; G03b 3/10

U.S. Cl. 178—7.2 **21 Claims**



The invention provides a system for modifying the electrical signal corresponding to the high frequency content of a video signal in accordance with variations in other parameters of the video signal, so as to render the modified signal substantially independent of such variations. Such modification is referred to as normalising the high frequency signal. One system is described for normalising with respect to the number of feature boundaries, another the density changes across the boundaries and another the obliquity of the boundaries to the scanning direction. A further modification allows improvement to the signal to noise ratio of the modified signal.

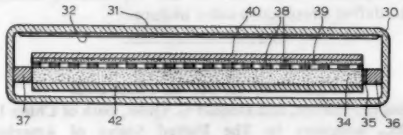
3,728,483
ACOUSTICALLY SCANNED IMAGE DISPLAY DEVICE

Robert Adler, Northfield, and Sam H. Kaplan, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed March 22, 1972, Ser. No. 236,885

Int. Cl. H01j 1/62, 63/04

U.S. Cl. 178—7.3 D **14 Claims**



An image display device features a generally thin envelope having a transparent viewing wall. A luminescent screen is disposed on the inner side of the viewing wall. Spaced within the envelope from the screen is a sheet of piezoelectric material which propagates acoustic wave s repetitively launched therein. Distributed over the piezoelectric sheet are an array of electron sources. These may be either sources for generating electrons from the vicinity of the surface of the sheet or a plurality of apertures in the sheet and through which a flow of electrons is controlled. In any case, the release of electrons toward the screen is in response to electric fields developed by the acoustic waves. An electron accelerating field is created between the sources and the screen, and the apparatus further includes an arrangement for modulating the intensity of the released electron stream in response to a video signal.

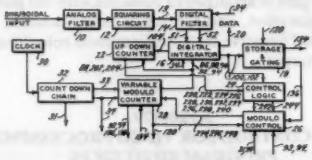
3,728,484
DIGITAL DEMODULATOR

Lynn J. Hawkey; William A. Landers, and Frank E. Nesbitt, all of Florissant, Mo., assignors to McDonnell Douglas Electronics Company, St. Charles, Mo.

Filed July 26, 1971, Ser. No. 166,054

Int. Cl. H03k 13/22

U.S. Cl. 178—68 **28 Claims**



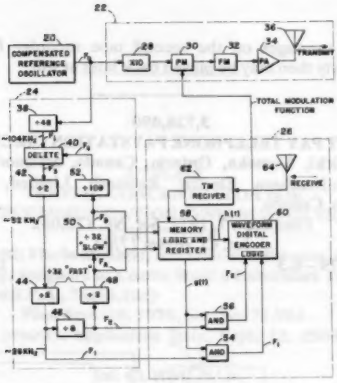
Accurate demodulation of a digital signal is effected by using a digital filter, a digital integrator and a digital counter to provide digital demodulation of that signal, and also by repeatedly updating the time base of the clock of that digital

demodulator throughout the time that signal is being demodulated.

3,728,485
TIME-MULTIPLEXED TIME REFERENCE DISSEMINATION SYSTEM

Eugene F. Osborne, Westminster; Lauren J. Rueger, Silver Spring, and Otis E. Gooding, Laurel, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed July 9, 1971, Ser. No. 161,032
Int. Cl. H04b 1/04
U.S. Cl. 178—69.5 R **6 Claims**



Signals produced by the Navy Navigation Satellite System enable a receiver of these signals to determine the precise time by decoding a certain portion of the transmitted signal. This portion is known as the beep word and represents a phase modulation pattern synchronized to Naval Observatory time. A method and apparatus is proposed to provide timing accuracy to within one-tenth of a microsecond by the addition of two modulation frequencies in the satellite's beep word that are coherent in time and frequency with the bit rate modulation on the RF carrier.

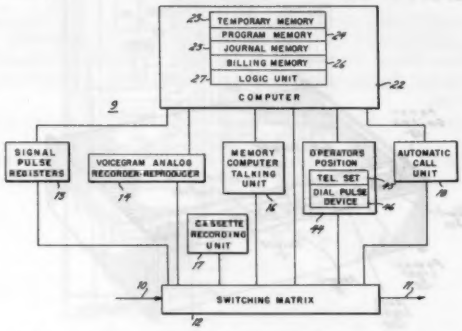
Since each Navy (Doppler) Navigation Satellite is radio "visible" to every position on earth at least twice each day, and moves frequently at high latitudes, a truly global system is proposed for the dissemination and recovery of high accuracy timing references that are related to a single Primary Standard of Time. The principal radio signals are transmitted one-way from satellite to ground.

3,728,486
VOICEGRAM SERVICE

Constantine Raymond Kraus, 845 Mount Moro Road, Villanova, Pa.

Filed Aug. 26, 1971, Ser. No. 175,069
Int. Cl. H04m 1/00
U.S. Cl. 179—2 R **33 Claims**

A voicegram service center for use with a telephone system, including recording as an analog signal at the service center, a voicegram of spoken words or data (datagram) received from a sending telephone subscriber's set, delivering to a preselected receiving telephone subscriber's set a reproduction voicegram in the sender's voice or reproduction data (datagram) as derived from the recorded analog signal at the service center, providing at the service center a cassette replica of the reproduction voicegram or data as delivered to the receiving set, and providing at the service center informa-

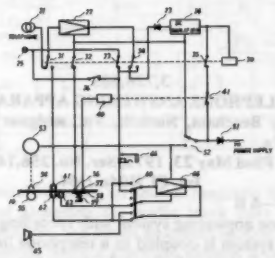


tion pertaining to the identifying numbers of the respective sending and receiving sets, the originating time and date of the voicegram or data, the time length of the voicegram or data recording, the delivery time and date of the reproduction voicegram or data, the number of attempts required to make the reproduction voicegram or data delivery, the time length of the reproduction voicegram or data delivery, and the class of the voicegram or data for computing the charge of the voicegram or data to the sending set.

3,728,487
AUTOMATIC TELEPHONE RESPONDING AND RECORDING SYSTEM

Kiyoshi Hata, Kobe, Japan, assignor to Funai Electric Company, Limited, Osaka, Japan

Filed Nov. 9, 1970, Ser. No. 87,746
Int. Cl. H04m 1/64
U.S. Cl. 179—6 R **3 Claims**

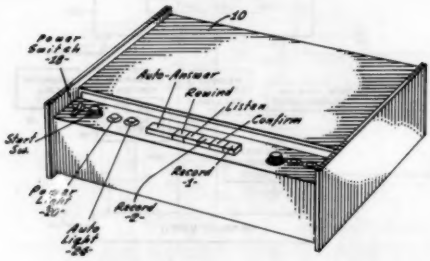


A recording and reproducing system utilizing a magnetic tape having at least two individual recording tracks with magnetic heads associated with each of said tracks, a circuit responsive to the call signal of a telephone to activate the recording and reproducing systems so that a previously recorded message can be transmitted to the caller and at the same time the caller's message can be recorded.

3,728,488
TELEPHONE ANSWERING SYSTEM AND APPARATUS INCLUDING IMPROVED RING RESPONSIVE CIRCUITRY FOR SELECTIVELY CONNECTING AND ISOLATING THE SYSTEM FROM THE TELEPHONE LINE

Elmer C. Bonsky, Long Beach, and Lawrence A. Curtis, Huntington Beach, both of Calif., assignors to T.A.D. Avanti, Inc., Paramount, Calif.

Filed May 8, 1972, Ser. No. 250,888
Int. Cl. H04m 1/64
U.S. Cl. 179—6 R 3 Claims



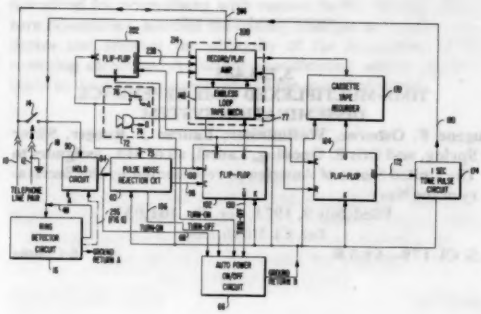
An improved telephone answering system and apparatus is provided which includes circuitry for sensing telephone rings, and which in response thereto seizes and holds the telephone line, and which in its standby state is fully isolated from the telephone line from a direct current standpoint. The system and apparatus of the invention responds to the ring signal to seize the telephone line, normally for a first time interval T_1 while an announcement is transmitted over the line to the calling party, and then for a time interval T_2 to permit the calling party to record his message. The system and apparatus responds to changes in voltage or current on the telephone line, indicating that the calling party has hung up, to return the system to its standby condition, in which it is again disconnected from the telephone line. The system and apparatus has an additional feature in the form of a timing circuit which automatically returns it to an off mode, isolated condition, in the event that the transition from T_1 to T_2 does not occur within the system within a certain time interval for any reason. This timing circuit assures that the unit will immediately be disconnected from the telephone line in the event of any malfunction within its circuitry.

3,728,489
TELEPHONE ANSWERING APPARATUS

Walter Gary Beacham, Norfolk, Va., assignor to BTI, Ltd., Norfolk, Va.

Filed May 23, 1972, Ser. No. 256,142
Int. Cl. H04n 1/64
U.S. Cl. 179—6 R 22 Claims

A telephone answering system with recording and playback modes. The system is coupled to a telephone line and is electrically independent of the telephone set with which it operates. The system is actuated by a ring signal on a telephone line and includes a circuit which is responsive to the ring signal to interrupt and seize the phone line for a short interval. Thereafter a hold circuit coupled to the line feeds its output to a pulse noise rejection circuit which determines if a true call is on the line and if so triggers a control circuit which causes a prerecorded message on a first tape recorder to be transmitted to the caller. Afterward, the system will couple any spoken message from the calling party to a second tape recorder in response to the prerecorded message. The

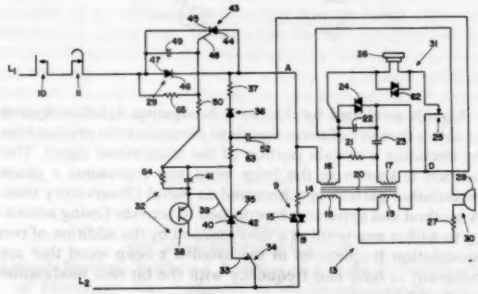


recorded messages on the second tape recorder from the calling party then may be played back later at will.

3,728,490
POST PAY TELEPHONE PAYSTATION CIRCUIT

Jan Nowicki, Komoka, Ontario, Canada, assignor to Bell-Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Sept. 7, 1971, Ser. No. 178,052
Int. Cl. H04m 17/02
U.S. Cl. 179—6.3 11 Claims



A telephone paystation which permits normal dialing to a called party without prior deposit of a coin. When the called party answers, the paystation transmitter circuit is completely disabled by transmitting reverse battery polarity from the central office to the telephone paystation. Normal operation is restored upon deposit of a coin by turning off a controlled rectifier which previously shunted the telephone line at the paystation.

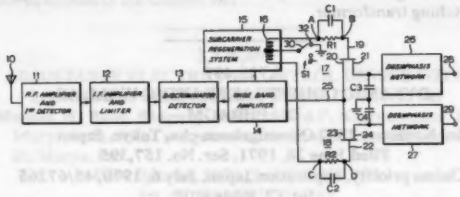
3,728,491
STEREOPHONIC FM RECEIVERS HAVING DECODERS EMPLOYING FIELD EFFECT TRANSISTORS

Roland H. Fichtner, Waterloo, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada

Filed March 5, 1971, Ser. No. 121,373
Int. Cl. H04h 5/00
U.S. Cl. 179—15 BT 10 Claims

The conventional four diodes of a stereophonic decoder are replaced by two field effect transistors, the composite FM

signal being applied to the input electrodes of the field effect



transistors and the 38 kHz switching signal being applied to the gate electrodes thereof.

3,728,492

TRAFFIC CONCENTRATOR FOR TELECOMMUNICATION SYSTEM WITH TREE STRUCTURE

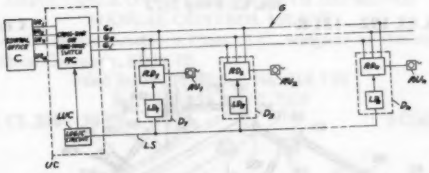
Ilio Cappetti; Flavio Melindo, and Giovanni Perucca, all of Turin, Italy, assignors to Centro Studi e Laboratori Telecomunicazioni S.P.A., Turin, Italy

Filed Sept. 10, 1970, Ser. No. 71,084

Claims priority, application Italy, Sept. 12, 1969, 53316 A/69

Int. Cl. H04j *3/12*

U.S. Cl. 179—18 FC **9 Claims**



A telephone system with a plurality of subscriber lines branched off a common trunk line with a number of parallel channels less than the number of subscriber lines includes a single service line extending from a terminal station to all the subscriber stations for the exchange of call, switching and disconnect signals. Each subscriber station is allotted a time slot in a scanning cycle established at the central office by a master clock and characterized by a relatively wide starting pulse followed by a series of relatively narrow address pulses each initiating a signaling interval assigned to a respective subscriber. A timer at a subscriber station, responding to the starting pulse, measures a delay period individual to that station at the end of which the assigned address pulse starts a slave clock conditioning the subscriber station for the transmission and reception of signals during specific phases of its time slot and for the seizure or release of a channel of the trunk line in response thereto.

3,728,493

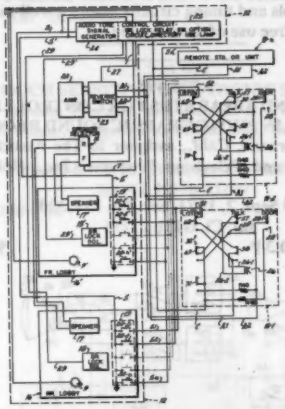
INTERCOMMUNICATION SYSTEM

William B. Ter Veen, Cincinnati, Ohio, assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed March 4, 1971, Ser. No. 121,034

Int. Cl. H04m *9/08*

U.S. Cl. 179—37 **3 Claims**



A two-way intercommunication system for selectively interconnecting a central station, such as an apartment or office lobby, with any one of a multiplicity of remote units, such as individual apartments or offices of a multi-unit building.

3,728,494

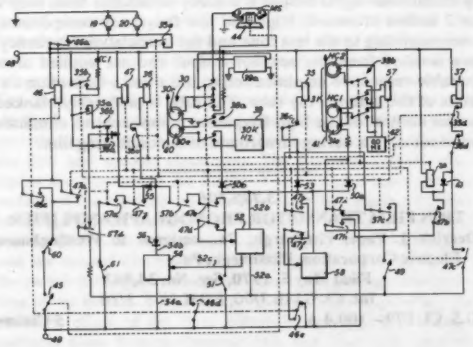
SIGNAL CONTROL SYSTEM FOR ENDLESS TAPE RECORDER

Richard Kobler, CH 6300 Zug, Switzerland, and William F. Fagan, Rochelle Park, N.J., assignors to McGraw-Hill Company, Elgin, Ill.

Filed Nov. 15, 1971, Ser. No. 198,874

Int. Cl. G11b *15/02*, *15/12*

U.S. Cl. 179—100.2 S **17 Claims**



A dictating machine using an endless magnetic tape records a control signal alongside the audio track only during the recording of dictation, and forms an erased section in advance of the last recording when a playback control is depressed to listen back to a portion of the recording and when the operator hangs up the microphone denoting the end of his use of the machine. A control signal detector allows the operator to rewind only to the beginning of his dictation assuring privacy to each user, and shifts the machine automatically into recording when he advances the tape to the prior position of farthest advance. Fast rewind and/or fast forward drive of the tape are possible only when the machine is in playback or when the operator hangs up the microphone. Either loss of control

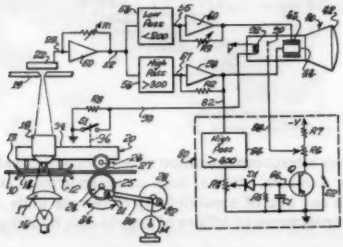
signal or release of a manual playback control stops the rewind and starts a normal advance of the machine in playback condition, which then continues until the forward mark — i.e., erased section — is reached. However, if the user presses the manual record control during playback the tape is moved fast forward until the forward mark is reached and the machine is then shifted automatically into normal record condition. Various safety controls and timing circuits assure a well-nigh automatic and error-free use of the machine.

3,728,495

METHOD AND APPARATUS FOR CONTROLLING DISTORTION IN PHOTOGRAPHIC SOUND RECORDS

Petro Vlahos, Tarzana, Calif., assignor to The Association of Motion Picture and Television Producers Inc., Hollywood, Calif.

Filed Sept. 2, 1971, Ser. No. 177,323
Int. Cl. G11b *27/36*
U.S. Cl. 179—100.3 P **9 Claims**



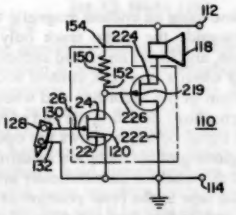
Correct exposure of photographic sound records for motion pictures and the like is insured by processing as part of each record a conventional test signal, scanning the completed test signal record, and producing a cathode ray tube display that shows both the magnitude and the direction of the change in printing exposure that is required to correct any distortion. The test signal typically comprises a high frequency tone that is amplitude modulated at a low frequency. The test record is preferably scanned by oscillating it back and forth, typically by hand, approximating one-tenth normal speed. An effectively continuous signal output is thereby obtainable from only 1 or 2 inches of record. High and low frequency components, corresponding to the test tone and the modulation frequency, are isolated from the scanner output and are applied after suitable respective amplification to the *x* and *y* deflection circuits of the cathode ray tube. The tube is preferably blanked under control of the high frequency component to eliminate spurious signals during turnaround of the oscillating film.

3,728,496

THIN FILM TRANSISTOR PHONOGRAPH AMPLIFIER

Derrick J. Page, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 5, 1970, Ser. No. 34,843
Int. Cl. G11b *3/00*; H03f *1/08*, *3/16*
U.S. Cl. 179—100.4 A **5 Claims**



This disclosure relates to an electrical circuit for conducting a signal from a high impedance ceramic pick-up cartridge, as is used in a phonograph, to a thin film field effect transistor and then to a speaker via a matching transformer.

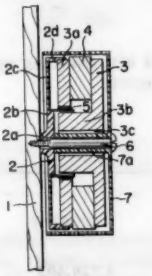
If desired, two thin film field effect transistors may be used and the signal fed directly to a speaker without employing a matching transformer.

3,728,497

DYNAMIC LOUDSPEAKER USING WALL AS DIAPHRAGM

Akira Komatsu, 2382 Oizumigakuen-cho, Tokyo, Japan

Filed June 28, 1971, Ser. No. 157,395
Claims priority, application Japan, July 6, 1970, 45/67265
Int. Cl. H04r *9/04*
U.S. Cl. 179—181 W **3 Claims**



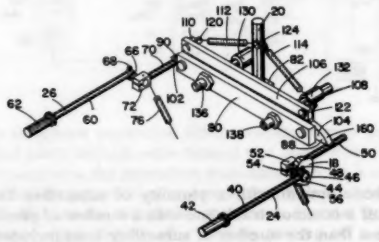
A hollow pillar portion is connected to the damper or casing of a transducer to mount the transducer onto a support on board member by a screw which passes through the hollow pillar portion. The hollow pillar portion enables both the low and high frequency characteristics to be maintained and enables the transducer to be affixed to the board member without rotation of the transducer.

3,728,498

SIMULTANEOUS DUAL HAND LEVER CONTROL

Ali R. Aslanbayrak, and Ovid W. Woods, both of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Aug. 9, 1971, Ser. No. 169,893
Int. Cl. F16p *3/22*
U.S. Cl. 192—131 R **10 Claims**



A dual hand lever control for actuating the shipper rod which controls a hydraulic press valve in response to the simultaneous depression of both hand levers. A cross bar, centrally attached to the lower end of the shipper rod, carries a pivotally mounted, bell-crank at each of its opposite ends. Each of these bell cranks is movable with the shipper rod and also is pivotable along a secondary path to permit movement of one of its bell-crank arms into and away from an intermediate position in the path of movement of its cooperating hand lever. A linking bar is pivotally connected at each of its ends to the other bell-crank arm of each bell crank. Actuation of a single control lever exerts a force on its bell crank to pivot the bell crank along its secondary path without moving the

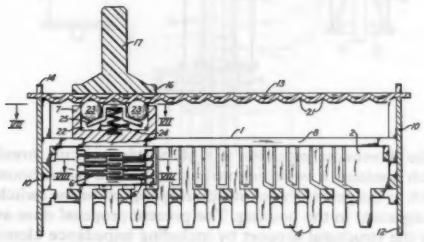
shipper rod and, through the linking bar, to withdraw the other bell crank from the path of movement of the hand lever. When both hand levers are operated, these forces are exerted on both bell cranks but are cancelled by the linking bar to permit actuation of the shipper rod.

3,728,499

ADJUSTABLE ELECTRICAL CONTROL DEVICE WITH LONGITUDINAL INDEXING FOR SLIDE SWITCH

Mogens W. Bang, Ridgway, and Richard P. Kronenwetter, St. Marys, both of Pa., assignors to Stackpole Carbon Company, St. Marys, Pa.

Filed Dec. 14, 1971, Ser. No. 207,902
Int. Cl. H01h *15/00, 1/42*
U.S. Cl. 200—16 F **8 Claims**



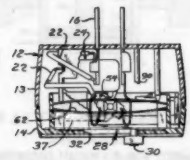
One wall, such as the upper wall, of an elongated case of an adjustable electrical control device is provided with a slot extending lengthwise of the case. Disposed in the case lengthwise thereof is a pair of laterally spaced electrical elements engaged by electric contact means carried by a slide extending through the slot. A bar above the case extends lengthwise of it and is provided with longitudinally spaced recesses. The slide is moved along the case by an actuator connected to it, and either the slide or the actuator carries spring-pressed means normally projecting into one of the bar recesses, whereby the slide and actuator can be indexed along the bar.

3,728,500

ADJUSTABLE ON-OFF TIMER WITH IMPROVED MANUAL CONTROL MEANS

Leslie G. Ingram, Southern Pines, N.C., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 7, 1972, Ser. No. 216,176
Int. Cl. H01h *43/10, 7/08*
U.S. Cl. 200—38 FB **3 Claims**



An one-off timer having a time drive dial and on and off members adjustably carried thereon, a switch controlling output power from the timer, a switch operator, trip members between the dial members and switch effective to actuate the switch responsive to movement of the dial members, and a manual selector control element for shifting and/or holding the switch in the power off or on conditions and/or allowing automatic on-off cycling of the timer.

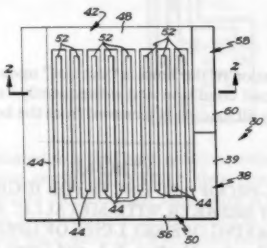
An on-off timer in essence provides for adjustably programmed on and off power outputs over some definite period, such as over a 24-hour period. Such automatically controlled power outputs during each of these time periods can be used for the operation of lights, appliances, etc., and the consumer has rapidly accepted such a timer. When it is desired to discontinue the automatic repeating cycle, there typically is provided a manual control to shift to the constant power "on" or power "off" condition.

3,728,501

TOUCH SENSITIVE ELECTRONIC SWITCH

Willis A. Larson, Wayzata, and Stephen R. Tell, Bloomington, both of Minn., assignors to Magic Dot, Inc., Minneapolis, Minn.

Filed March 16, 1972, Ser. No. 235,373
Int. Cl. H01h *35/00*
U.S. Cl. 200—52 **4 Claims**



A touch sensitive electronic switch which has no moving parts and is actuated by the skin resistance of an operator causing a lowering of D.C. resistance across the face of the switch is disclosed. The electronic switch, in the preferred embodiment shown, includes three electrodes spaced and arranged with respect to each other upon an insulator. The second electrode is laterally spaced and insulated from the first electrode and arranged around and about the first electrode with the level of the top surface of the second electrode rising above the level of the top surface of the first electrode. The third electrode is laterally spaced and insulated from one electrode and vertically spaced from the other electrode to provide a conductive electrical shielding electrode between the first and second electrodes. The first and second electrodes are exposed to the finger of an operator upon the top surface of the insulator in a manner that the operator's finger bridging between the fist and second electrodes allows a direct current path to be set up laterally between the first electrode and the second electrode to thereby provide an activation of the switch through a lowering of the D.C. resistance across the face of the switch. When the operator's finger is removed, the shielding effect of the third electrode prevents any leakage currents from flowing between the first electrode and the second electrode and establishing such a direct current path.

3,728,502

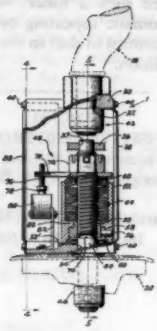
ELECTRIC HOIST OVERLOAD PROTECTION DEVICE

Harold V. Hawkins; Ralph A. Dick, both of Williamsville, and Allan E. Eldridge, Tonawanda, all of N.Y., assignors to Columbus McKinnon Corp., Tonawanda, N.Y.

Filed Sept. 24, 1971, Ser. No. 183,430
Int. Cl. H04h *3/14*
U.S. Cl. 200—85 R **12 Claims**

A hoist overload prevention device featuring a pair of spring devices deformable under relatively low and relatively high

loading conditions, and a snap action switch arranged to be "reset" and "cut out" during such low and high loading conditions, respectively, whereby an electric circuit for controlling



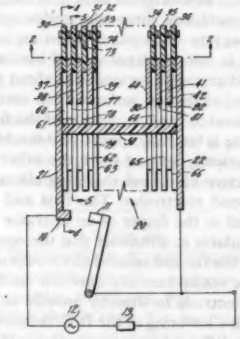
lifting operation of the hoist is "cut out" upon the occurrence of an overload condition and subsequently "reset" only after substantially all loading is removed from the hoist.

3,728,503

SHOCK-PROOF ARC CHUTE FOR HIGH VOLTAGE CIRCUIT BREAKER WITH METALLIC ARC PLATES HAVING OFF-SET LINES OF OPENINGS

Challiss I. Clausing, Marlton, N.J., and Frank J. Pokorny, Hatboro, Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Jan. 22, 1971, Ser. No. 108,872
Int. Cl. H01h *33/08*
U.S. Cl. 200—144 R **12 Claims**



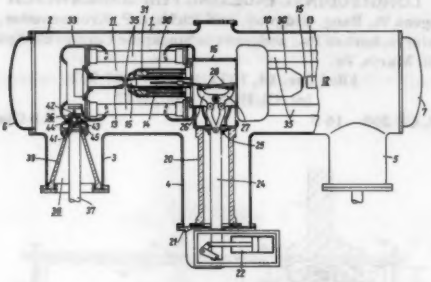
An arc chute is provided for use in high voltage circuits which uses a plurality of spaced metallic plates spaced by fiber spacers. The fiber spacer plates have alternately displaced, laterally extending slots, which extend above the tops of the metallic plates, to define a sinuous chamber above the top of the metal plates which encourages arc product turbulence between spaced metal plates and above the top of the metal plates. Each metal plate has a longitudinally extending series of spaced holes displaced from the center of the plate, with the series of holes of adjacent plates being alternately laterally displaced.

3,728,504

HIGH VOLTAGE CIRCUIT BREAKER

Helmut Beier, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 4, 1972, Ser. No. 223,637
Claims priority, application Germany, Feb. 17, 1971, P 21 08 265.5
Int. Cl. H01h *33/16*
U.S. Cl. 200—144 AP **7 Claims**



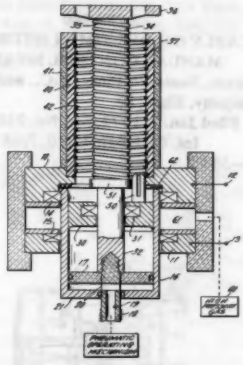
The invention proposes a high voltage circuit breaker, which contains a switching arrangement in a metal housing, which in the past included structural support for the switching arrangement in the housing. The present proposal does away with the structural support by including impedance elements into the housing which have sufficient rigidity so as to act as a mechanical support and thus obviate the use of other structural elements.

3,728,505

RESISTOR AND MEANS FOR GRADUALLY INSERTING RESISTOR IN PARALLEL WITH INTERRUPTER CONTACTS

Lorne D. McConnell, Radnor, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed July 26, 1971, Ser. No. 165,508
Int. Cl. H01h *33/16*
U.S. Cl. 200—144 AP **6 Claims**

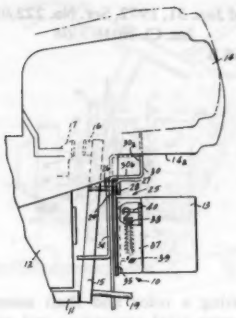


An opening resistor for a circuit interrupter consists of first and second concentric helically wound resistor sections normally spaced from one another, and are respectively connected to the cooperating contacts of a circuit interrupter. When the contacts open, an initial arc is transferred by a blast of gas to extend across the ends of the resistor sections. This gas blast and the magnetic field of the arc current exert a force on the arc causing the arc roots to rotate on the helical resistor sections so that the arc moves toward the other end of the helical resistor windings, thereby to insert increasing resistance in parallel with the contacts, and arc, in a non-step fashion.

3,728,506
CONTACTOR WITH A REMOVABLE ARC CHUTE

Arthur C. Heehler, Park Ridge, and George J. Taylor, Northbrook, both of Ill., assignors to Mercor Corporation, Franklin Park, Ill.

Filed Oct. 21, 1971, Ser. No. 191,529
Int. Cl. H01h 33/46
U.S. Cl. 200—144 R 11 Claims



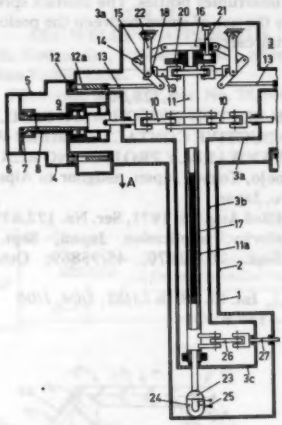
A contactor with a removable arc chute having a clapper plate carrying a movable contact to make and break contact with a fixed contact in accordance with a contact signal applied to an actuator characterized by a latch or safety mechanism for preventing movement of the clapper plate to a position to make contact when the arc chute is removed or displaced from the predetermined position with respect to the contacts. Preferably the latch mechanism also prevents breaking of contact should the arc chute be dislodged. The safety or latch mechanism comprises a pin attached to the clapper plate and having an end surface forming one abutment surface and a second abutment surface formed by a groove in the pin which abutment surfaces coact with edges of a keyhole slot of a slideable plate member carried on the housing of the switch assembly. The plate member with the keyhole slot is movable from a locking position for engaging either the end of the pin or the groove thereof to an unlocking position in which the pin can pass through the wide portion of the keyhole slot. When the arc chute is on the housing in the predetermined position, the chute will hold the sliding plate in the second position enabling free movement of the clapper plate in response to the actuator.

3,728,507
PRESSURE-GAS ACTUATED ELECTRICAL CIRCUIT BREAKER

Dieter Floessel, Fislisbach, and Henri Clerc, Zurich, both of Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed March 27, 1972, Ser. No. 238,117
Claims priority, application Switzerland, April 2, 1971, 4816/71
Int. Cl. H01h 33/54
U.S. Cl. 200—148 D 4 Claims

An electrical switch of the gas blast type in which the contacts and a reversible drive mechanism therefor are admitted with pressurized gas controlled through a blast valve. A control rod extending upwardly through a columnar support mounting a storage chamber for the pressurized gas, an arc extinguishing chamber within which the contacts are closed, the blast valve and drive mechanism, is coupled to the blast valve through a system of levers and other mechanism such that when the control rod is released for upward movement, the blast valve moves automatically to its open position, the

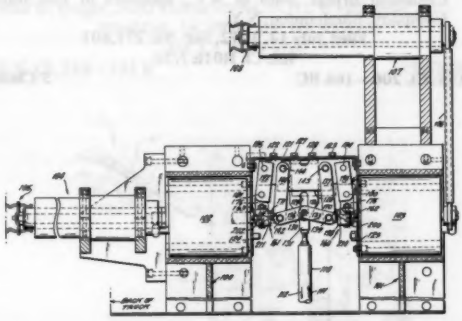


contacts are actuated to a first limit position, either closed or open, by the drive mechanism which is then reset for movement in the opposite direction, the blast valve is re-closed in readiness for the next actuation of the contacts to the other limit position, and the control rod is returned downward to its starting position.

3,728,508
OPERATING MECHANISM FOR VACUUM CIRCUIT BREAKER INCLUDING CONTACT PRESSURE SPRINGS

Philip C. Netzel, Milmont Park, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Oct. 26, 1971, Ser. No. 192,029
Int. Cl. H01h 3/00
U.S. Cl. 200—153 V 6 Claims



A circuit breaker contains a pair of series-connected vacuum interrupter units which are coaxial with one another and spaced from one another. An operating mechanism is disposed between the vacuum interrupters, and is operated by an operating linkage moving along a line perpendicular to the axes of the vacuum interrupters. The operating linkage in-

cludes a toggle-type mechanism between the bottles which is expanded and contracted by the movement of the operating rod in order to operate the vacuum interrupter contacts simultaneously. A pair of conductive links used to connect the interrupters in series are used as parallelogram links for the operating toggle mechanism links. Contact loading springs are placed mechanically between the ends of the toggle links and the vacuum interrupter bottles. The contact spring forces are adjustable by the use of shims between the preloading springs and their spring carriers.

3,728,509

PUSH-BUTTON SWITCH WITH RESILIENT CONDUCTIVE CONTACT MEMBER WITH DOWNWARDLY PROJECTING RIDGES

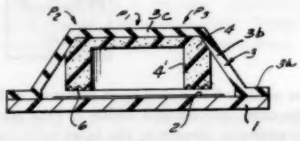
Takemi Shimojo, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1971, Ser. No. 172,637

Claims priority, application Japan, Sept. 26, 1970, 45/95868; Sept. 26, 1970, 45/95869; Oct. 12, 1970, 45/101247

Int. Cl. H01h *13/52, 1/04, 1/06*

U.S. Cl. 200—159 B **12 Claims**



A push-button switch comprises a substrate on which two conductive networks are formed, those networks comprising adjacent but separated conductive paths, a push-button member with a contact member thereon being mounted on the substrate with the contact member normally above and in registration with the separated conductive paths. The contract member is formed of elastic and electrically conductive material and is adapted when it is pushed down via the push-button member to engage the substrate, and hence the separated conductive paths, over an appreciable area, thereby ensuring effective switch operation.

3,728,510

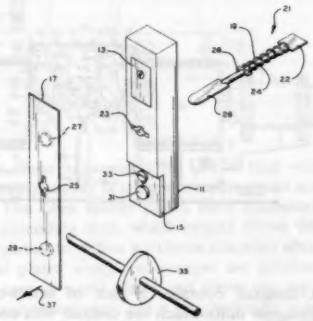
ELECTRICAL CONTACT RETAINING DEVICE

Richard M. Wallace, Kirkwood, and Michael D. Snyder, Chenango Bridge, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed July 14, 1972, Ser. No. 271,801

Int. Cl. H01h *1/50*

U.S. Cl. 200—166 BC **5 Claims**



A switch having contacts which may be inspected, cleaned and replaced without the danger of removing and losing small hardware items. The switch contact arm is held in place by a spring loaded key keeper with the arm and switch block each keyed 90° apart. Rotation of the keeper to remove the arm orients it so that it will not slip through the block and become lost.

3,728,511

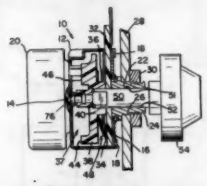
CONTROL WITH ROTOR AND SHAFT ASSEMBLY

Lee R. George, and Edgar F. Hauenstine, both of Frankfort, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jan. 31, 1972, Ser. No. 222,057

Int. Cl. H01h *3/08*

U.S. Cl. 200—168 B **10 Claims**



A control having a rotor and shaft assembly anchored together to prevent axial separation and relative rotation between the shaft and the rotor.

3,728,512

HIGH FREQUENCY HEATING APPARATUS

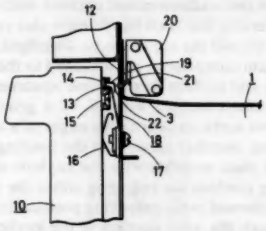
Yoshiaki Shirakami, Otsu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed March 1, 1971, Ser. No. 122,631

Claims priority, application Japan, Oct. 23, 1970, 45/93735

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 **5 Claims**



In a high frequency heating apparatus including a cubiform cavity or oven of conductive material having an opening, a supply source for supplying high frequency energy into the cavity and a door for providing access to the cavity mounted so as to close the opening; a periphery of the door has a sash with a groove thereon extending along the periphery and a periphery surrounding the opening of the cavity has a sensing member with a protrusion for fitting in the groove when the door is closed.

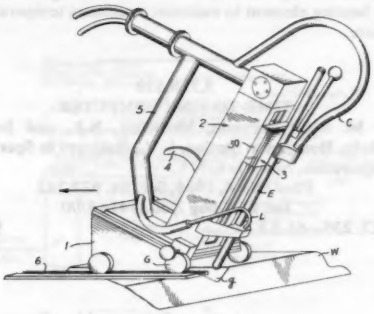
The sensing member is urged away from the peripherel surface of the cavity by virtue of a spring and when the door is closed the protrusion of the member is fitted in the groove. However, if a door is inadvertently closed with an obstacle such as a dish-cloth sandwiched between both peripheries of the door and cavity, the obstacle depresses the protrusion and the sensing member is forced toward the peripheral surface of the cavity.

A safety switch is provided in engagement with the sensing member for turning off the supply source in response to the depression of the member caused by the obstacle. Therefore, leakage of the high frequency energy caused by the sandwiched obstacle is prevented.

3,728,513
ELECTRIC ARC CUTTING APPARATUS

Paul Jean Raymond Charrier, Equeurdreville, and Gilbert Georges Costedoat, La Montagne, both of France, assignors to Etat Francais represents Bar le Ministre charge de la Defense National Delegation Ministerielle Pour l Armement, Paris, France

Filed May 20, 1971, Ser. No. 145,181
Claims priority, application France, May 21, 1970, 7018471
Int. Cl. B23p 1/08, 1/14
U.S. Cl. 219—70 9 Claims

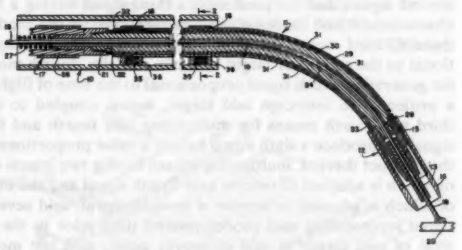


An electric arc cutting apparatus comprises a carriage having wheels, one of which is guided in a rail so that the carriage can travel along a given path with respect to a workpiece. The wheel in the rail is adjustable on the carriage in a direction perpendicular to the rail. A frame is fixed on the carriage and carries a slidable holder for an electrode. A trigger is connected to the holder via a wire passing on pulleys, and by displacing the trigger, the holder and electrode secured thereto are conjointly displaced. One of the pulleys is spring-loaded to return the holder and electrode to an initial inoperative position when the trigger is released.

3,728,514
THERMIONIC INSULATED ARC WELDING GUN

Arthur A. Bernard, Beecher, and Richard A. Bernard, Flossmoor, both of Ill., assignors to Bernard Welding Equipment Company, Beecher, Ill.

Division of Ser. No. 818,954, April 24, 1969, abandoned. This application Dec. 21, 1970, Ser. No. 100,518
Int. Cl. B23k 9/00
U.S. Cl. 219—130 4 Claims

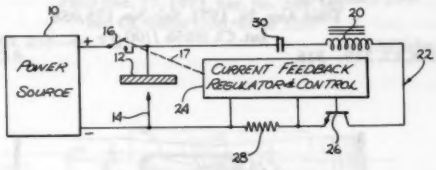


Improved means of insulating that portion of an air cooled arc welding gun which extends between the handle portion and the head portion to prevent thermionic emission dense enough to establish the conductance of welding current between it and the weldment, improved means for enclosing the welding current circuit suspended within the handle of the gun within a tube composed of insulating material to reduce the amount of heat radiated from the circuit within the handle, and improved means for suspending a highly heated welding current circuit within the handle to provide space between the wall of the handle bore and the suspended heated circuit for the circulation of cooling air therethrough. Also disclosed is the method of making the improved structure.

3,728,515
ARC WELDING APPARATUS

Mindaugas E. Gedgaudas, Valencia, Calif., assignor to Astro-Arc Co., Sun Valley, Calif.

Filed Sept. 25, 1970, Ser. No. 75,540
Int. Cl. B23k 9/10
U.S. Cl. 219—131 R 3 Claims

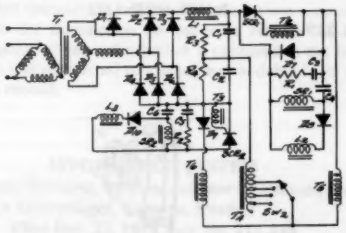


Herein described is electronic circuitry used in an arc welding apparatus which provides continuous melting and etching action for the duration of a weld. This is achieved by providing a polarity reversing circuit comprising an electric current storage medium such as an inductor and a current limiter attached across the welding arc electrode and the workpiece. The current limiter allows a certain amount of current to be drawn from the welding power supply to induce electromagnetic energy into the inductor. The current flowing into the inductor and the current limiter bypasses the welding arc and establishes a magnetic field in the inductor. At the termination of the current from the power supply to the electrode, the current induced in the inductor by its collapsing magnetic field flows through the current limiter and through the electrode in a reverse direction, thus causing periodic polarity reversal at the electrode to perform the etching cycle.

3,728,516
WELDING POWER SOURCE

Alex D. Daspit, 3633 Fulton Street, N.W., Washington, D.C.

Filed Oct. 16, 1970, Ser. No. 81,426
Int. Cl. B23k 9/10
U.S. Cl. 219—131 R 19 Claims



A power source for a welding machine wherein, in one embodiment, both the arc voltage and current are sensed and the frequency of a pulse train, which is integrated to produce the arc signal, is varied in accordance with the sensed voltage and

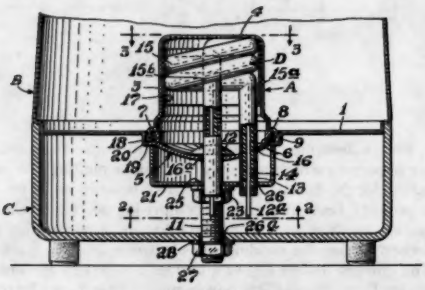
current. In one embodiment, a capacitor is periodically semi-discharged through a switching device, such as an SCR. The resulting voltage pulse train is integrated to produce the welding signal. In another embodiment, two capacitors are alternately semi-discharged through separate current paths which each include a switching device, such as an SCR, and a common primary winding of a transformer by shifting the SCR's from their conductive to non-conductive states and vice versa. The transformer has two secondary windings one of which provides a high voltage, low current output and the other of which provides a high current output. Both outputs are integrated and combined to produce the welding signal.

3,728,517

ELECTRIC HEATER AND MOUNTING THEREFOR

George E. Tilp, Short Hills, N.J., assignor to Adams Industries, Inc., Union, N.J.

Filed Aug. 26, 1971, Ser. No. 175,058
Int. Cl. H05b 1/00
U.S. Cl. 219—316 4 Claims



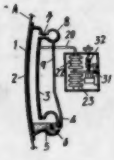
A cup-shaped casing has a self-sustaining insulated wire coil therein whose ends project through holes in a cap plate which closes the open end of the casing and over whose edge is die-pressed the rim of the casing to secure the cap in the casing, and a bolt passes through a hole in said cap with its head abutting the inner side of the cap and with its shank and nut coacting with a retaining cup to clamp the wall of a container between the cup and a circumferential extension bead on the casing, thereby to mount the heater in the container.

3,728,518

APPARATUS FOR HEAT TREATMENT OF SYNTHETIC YARN

Nobuhisa Kodaira, 7-1, 2-chome, Kamirenjaku, Mitaka-shi, Tokyo, Japan

Filed Sept. 15, 1971, Ser. No. 180,708
Int. Cl. H05b 1/02
U.S. Cl. 219—326 6 Claims



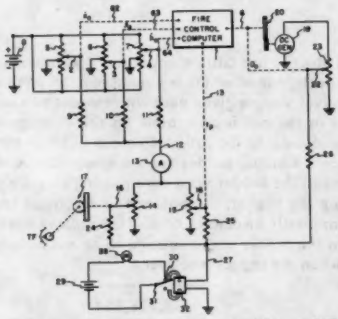
In heat treatment apparatus for the treatment of synthetic yarns and the like, a plurality of heat-transfer jackets having replaceable heating plates thereon are connected to a common liquid heating chamber and a common header or condenser to form a closed heating system. The jacket and header are connected through a restricted orifice to provide a fluid-pressure resistance so that the heated liquid in the chamber when vaporized flows into the upper portion of the heating jacket, through the orifice and into the header where it condenses. The restricted orifice increases the velocity of the vapor flowing into the header preventing the condensation of the vapor at the upper portion of the jackets to thereby eliminate non-uniform temperature areas on the external surfaces of the heater plates. A pressure sensor is connected to at least one of the jackets and includes switching means to control a heating element to maintain a constant temperature and pressure.

3,728,519

TIME-TO-FIRE COMPUTER

Peter M. Saint Germain, Montclair, N.J., and Joseph F. Nekola, Huntington Station, N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 6, 1956, Ser. No. 627,722
Int. Cl. G06g 7/80; F41g 3/00
U.S. Cl. 235—61.5 E 9 Claims



1. In a gun fire control system for the interception of a target at a predetermined point in time prior to the time at which the target will arrive at the crossover point, apparatus comprising first means for generating a first signal proportional to target radial range, second means for generating a second signal proportional to target radial range rate, means coupled to said first and second means for multiplying said first and second signals and for producing a third signal having a first characteristic and having a value proportional to the product thereof, third means for generating a fourth signal proportional to the square of target absolute velocity, fourth means for generating a fifth signal proportional to the time of flight of a projectile to intercept said target, means coupled to said third and fourth means for multiplying said fourth and fifth signals to produce a sixth signal having a value proportional to the product thereof, multiplying means having two inputs one of which is adapted to receive said fourth signal and the other of which is adapted to receive a seventh signal, said seventh signal representing said predetermined time prior to the arrival of said target at said crossover point, said last means producing an eighth signal having a value proportional to the product of said fourth and seventh signals, means adapted to receive said sixth and eighth signals and operative to produce a ninth signal having a second characteristic and having a value proportional to the sum thereof, means for comparing the values of said third and ninth signals to produce a tenth signal having a value proportional to the difference therebetween and having the same characteristic as that one of said third and ninth signals having the greater value, and

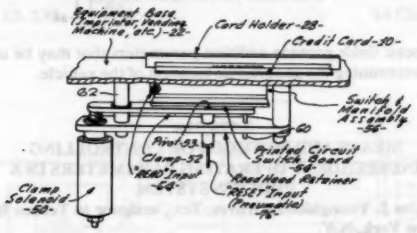
utilization means selectively responsive to a predetermined characteristic of said tenth signal, said tenth signal being applied to said utilization means.

3,728,520

CREDIT CARD SENSING APPARATUS

Davies Allport, La Jolla, Calif., assignor to Cubic Corporation San Diego Calif.

Filed Nov. 10, 1971, Ser. No. 197,460
Int. Cl. G06k *7/02*; **H01h** *35/24*
U.S. Cl. 235—61.11 J **7 Claims**



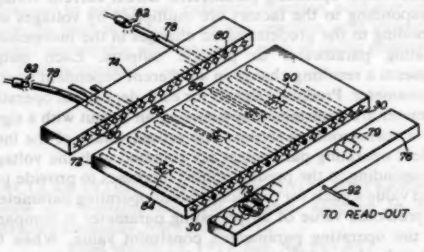
An improved sensing apparatus is provided for reading coded embossments on a credit card which represent the account number thereof, or other data. The apparatus is for use in a credit verification system. The sensing apparatus of the invention forms a component of the sales slip imprinter mechanism which is presently used in conjunction with credit card transactions, in order to provide a record of the transaction for billing purposes. The sensing apparatus of the invention includes a multiplicity of pneumatically actuated diaphragm switches which are operated in a pattern corresponding to the coded embossments on the credit card being sensed. The switches make selective electrical contact with a circuit board, and they cause binary coded decimal signals to be stored in a register which represent the account number of the card, or other relevant data, the signals being used in the system to verify the validity of the particular card; or for accounting purposes, or for storage of data for later use.

3,728,521

ENCODED CARD EMPLOYING FIBER OPTIC ELEMENTS

Howard C. Borough, Seattle, Wash., and Donald A. Pontarelli, Chicago, Ill., assignors to Bliss & Laughlin Industries, Incorporated, Oak Brook, Ill.

Filed Sept. 29, 1970, Ser. No. 76,523
Int. Cl. G06b *5/16*; **G06k** *7/10, 19/06*
U.S. Cl. 235—61.12 N **8 Claims**



An encoded card having a layer of light-transmitting elements such as fibers extending between two edges, the fibers being individually capable of transmitting magnetic radiant energy, in the visible, ultraviolet or infrared spectral regions.

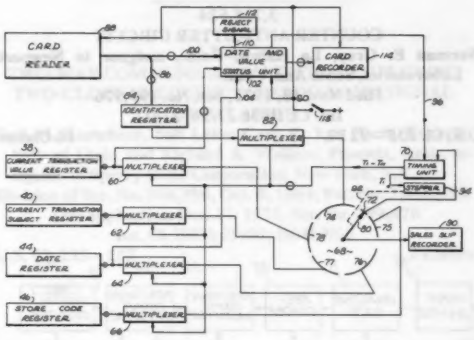
The ends of the energy-transmitting fibers along at least one edge of the card are irregularly arranged in a linear information-related pattern which is decoded into discrete information such as numbers, letters or words by transmitting electromagnetic radiation, such as visible or invisible light through the fibers and sensing and decoding the transmitted pattern. The card is encoded either by selectively placing the fibers; or by cutting, removing, or otherwise impairing the energy-transmitting ability of selected fibers.

3,728,522

POINT-OF-SALE CREDIT TRANSACTION SYSTEM

Daniel Norwich, Beverly Hills, Calif., assignor to Telecredit, Inc., Los Angeles, Calif.

Filed Dec. 17, 1971, Ser. No. 209,264
Int. Cl. G05b *1/00*; **G06r** *5/00*
U.S. Cl. 235—61.7 B **3 Claims**



A credit transaction system is disclosed for use with cards (carrying machine-readable identification of the user) and sales records (bearing a recording medium). The system receives a card along with a blank sales record for processing an anticipated sale or other transaction. The value of the transaction, and identification of the subject thereof, the date, the location of the system, and so on are supplied to the system for the development of representative electrical signals. The signals representative of the transaction are processed to arrive at an approval or disapproval of the transaction and in that regard the card is updated. Additionally, if the transaction is approved, the system records data pertinent to the transaction on the sales record. As a consequence, point-of-sale information is captured in the form of source data and converted to a machine-readable form on the transaction record.

3,728,523

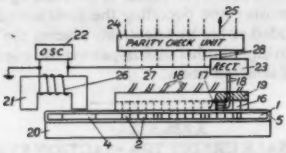
INFORMATION SYSTEM

Vilmos Torok, Vasteras, Sweden, assignor to Allmana Svensha Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 23, 1971, Ser. No. 211,248
Claims priority, application Sweden, Jan. 19, 1971, 565/71
Int. Cl. G06r *19/00, 7/08*
U.S. Cl. 235—61.11 H **3 Claims**

An information system includes an information carrier and a reading unit. The information carrier includes an inner and an outer layer, the outer layer constituting a protective casing surrounding the inner layer and hiding the information. The

inner part is formed of at least one electrically conducting closed loop in which an electrical current is intended to be induced, this loop having a plurality of openings therein in the same plane. These openings are so positioned that at least two parallel current paths are produced partly in the loop. One of



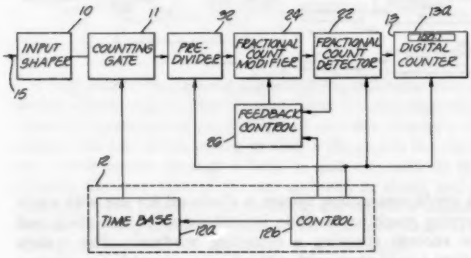
the current paths is decreased in its average area by at least one interruption so that the other current path will carry the main part of the current induced through the loops. A combination of these interruptions forms the information on the carrier. The reading units include an arrangement for detecting differences in the currents in said paths.

3,728,524

COUNTER ANTI-JITTER CIRCUIT

Norman E. Gray, La Habra, Calif., assignor to Newport Laboratories, Santa Ana, Calif.

Filed Nov. 18, 1971, Ser. No. 199,976
Int. Cl. H03k *21/34, 21/02*
U.S. Cl. 235—92 PL **16 Claims**



A digital counter which incorporates a circuit to reduce or prevent jitter in output readings. During a time base signal, a fraction count circuit determines the fractional count of input signals. This fractional count information is combined with input signals prior to the time base signal by using a fractional count modifier circuit. The fractional count modifier circuit modifies the phase of the input signals prior to the start of the time base.

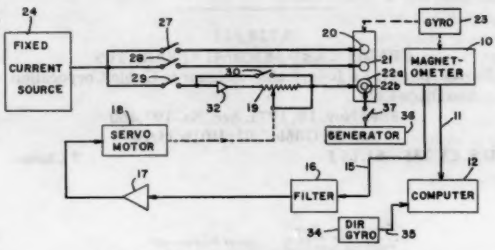
3,728,525

MAGNETIC NAVIGATION SYSTEM

Chintamani K. Adkar, Pierrefonds, Canada, assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 19, 1971, Ser. No. 190,592
Int. Cl. G01c *21/08;* **G01r** *33/02;* **G01v** *3/14*
U.S. Cl. 235—150.271 **10 Claims**

A magnetometer mounted on a vehicle is used for sensing the earth's ambient magnetic field. Various magnetic fields in specified planes are generated and applied to the magnetometer in addition to the earth's field for obtaining fixed magnetic deviations in the specified planes. Various arithmetic operations to the measured values of the ambient and generated



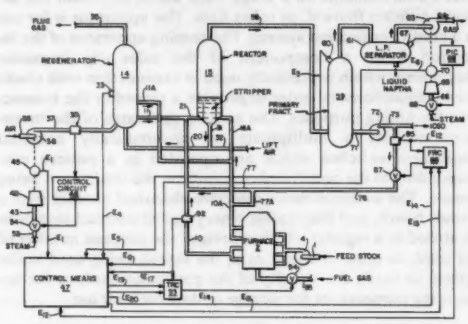
magnetic fields provide addition parameters that may be used for determining the geographic location of the vehicle.

3,728,526

MEANS AND METHOD FOR CONTROLLING INDEPENDENT OPERATING PARAMETERS IN A PROCESS SYSTEM

Douglas J. Youngblood, Groves, Tex., assignor to Texaco Inc., New York, N.Y.

Filed July 8, 1971, Ser. No. 160,692
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.1 **14 Claims**



A control system controls a process system for periodically changing the values of first and second independent operating parameters of the process by predetermined amounts when the system has determined that the increases will not cause any operating parameter of the process system to exceed a constraint value. Various variable operating parameters, including the first and second independent operating parameter, are sensed by sensors which provide corresponding signals. A pair of factors, related to resulting changes in the values of a dependent operating parameter due to changes in the independent operating parameters, is predetermined for each of the dependent operating parameters. Direct current voltages corresponding to the factors are multiplied by voltages corresponding to the predetermined changes in the independent operating parameters to provide outputs. Each output represents a resulting change in a different dependent operating parameter. Predicted signals for each dependent operating parameter are determined by summing an output with a signal from a corresponding sensor. The sensed values of the independent operating parameters are summed with the voltages corresponding to the predetermined increases to provide predicted value signals for the independent operating parameters. The predicted value of an operating parameter is compared with the operating parameter's constraint value. When the predicted values of the operating parameters associated with an independent operating parameter do not exceed the corresponding constraint values, the independent operating parameter is changed in value by the predetermined amount. When at least one predicted value of a dependent parameter

associated with an independent operating parameter exceeds a corresponding constraint value, the independent operation parameter maintains its present value.

3,728,527

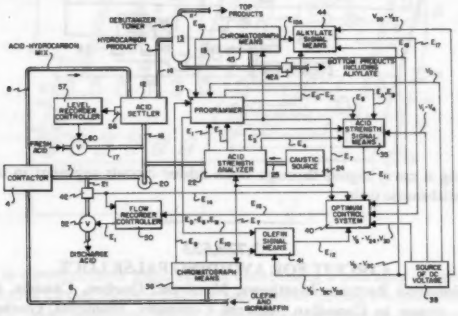
MEANS AND METHOD FOR ACHIEVING AN OPTIMUM ACID STRENGTH FOR AN ALKYLATION UNIT

Walter L. Hopkins, Houston; Donald E. Sweeney, Jr., Beaumont, and Herbert J. Pitman, Nederland, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 24, 1972, Ser. No. 228,826

Int. Cl. G06f *15/46*; C07c *3/52*

U.S. Cl. 235—151.12 **14 Claims**



A control system controls the acid strength of reaction acid in an alkylation unit reacting an olefin with an isoparaffin in the presence of the reaction acid to eventually produce an alkylate. The system senses the actual reaction acid strength, the discharge acid flow rate, the flow rate of discharge acid leaving the alkylation unit, the bottom products flow rate and the alkylate content of the bottoms product from a debutanizer tower and the propylene and butylene content of the olefin stream entering the alkylation unit. Using equations hereinafter disclosed, along with economic values associated with the acid and the alkylate, the control system periodically determines the optimum reaction acid strength. When the change in the reaction acid strength necessary to achieve the optimum reaction acid strength is less than a predetermined change, the necessary change is implemented. When the necessary change is greater than the predetermined change, the reaction acid strength is changed by an increment equal to the predetermined change. Where the reaction aicd strength is decreased to achieve an optimum reaction acid strength, a minimum limit is imposed on the reaction acid strength to prevent undesirable side reactions, such as olefin polymerization, from occurring.

3,728,528

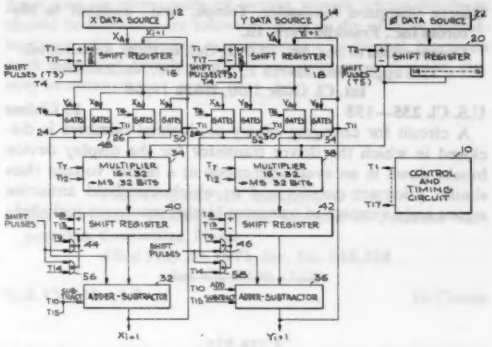
CIRCULAR INTERPOLATION BY FINITE DIFFERENCES

Ronnie G. Walters, Mayfield Heights, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed March 24, 1971, Ser. No. 127,657

Int. Cl. G06f *7/38*

U.S. Cl. 235—152 **8 Claims**



A sine cosine generator is described which can iteratively rotate an initial condition vector at a predetermined rate thus producing points which lie on a circle whose radius is determined by the initial condition vector.

3,728,529

TWO-WAY COMMUNICATION SYSTEM EMPLOYING TWO-CLOCK FREQUENCY PSEUDO-NOISE SIGNAL MODULATION

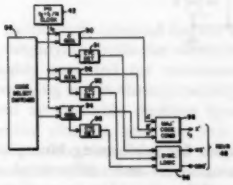
Earl M. Kartchner, Salt Lake; Gary R. Van Horn, Granger, both of Utah, and Richard A. Wallace, Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 864,596, Oct. 8, 1969, Pat. No. 3,665,472.

This application Dec. 17, 1971, Ser. No. 209,476

Int. Cl. H03b *29/00*; H04l *9/00*

U.S. Cl. 235—152 **2 Claims**



A digital two-way communication system utilizing RF transmissions that are phase-shift-keyed (PSK) by binary pseudo-noise (PN) code generators operating at different clock rates. Transmissions in the first and second directions are modulated by composite PN code generators operating at different first and second clock frequencies f_1 and f_2, respectively, where $f_1 = NF_2$, with N being a positive integer having no factors in common with the lengths of the component PN coder from which the composite is formed. The binary digital data signals that are to be transmitted in either direction modulate a binary PN code which is a composite code generated from a plurality of component PN codes. Each of these data-modulated composite PN codes, which are generated at clock frequencies f_1 and f_2, respectively, modulates, in turn, an RF carrier signal.

By having the two communication stations transmit and receive at different PN clock frequencies, equipment limitations that restrict transmitter performance in the second direction need not limit performance in the first direction, thereby allowing a higher clock frequency f_1, in the first direction and subsequent lower power required at the receiver at the other end for the same SNR out of the receiver.

3,728,530
BINARY TO DECIMAL CONVERTER CIRCUIT

George Sheppard Alexander, Tempe, Ariz., assignor to Motorola Inc., Franklin Park, Ill.

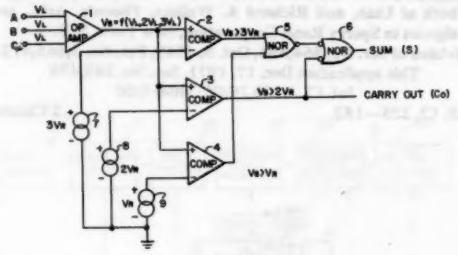
Continuation of Ser. No. 79,092, Oct. 8, 1970, abandoned.
This application March 13, 1972, Ser. No. 234,386
Int. Cl. G08c 5/00; H03k 19/08
U.S. Cl. 235—155 15 Claims

A circuit for changing binary to decimal numbers is disclosed in which the driver transistor for the display device breaks down in an avalanche mode at a higher voltage than similar prior art circuits and in which threshold antinoise means and an improved transistor biasing means are included.

3,728,531
BINARY ARITHMETIC USING ANALOG COMPARATORS

J. Beverly Young, Jr., Carlisle, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed July 16, 1971, Ser. No. 163,225
Int. Cl. G06f 7/50, 7/385
U.S. Cl. 235—175 8 Claims



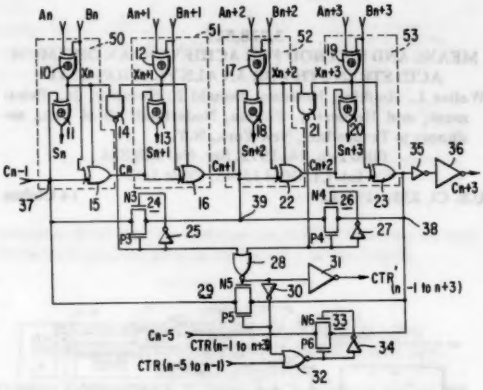
A binary adder for performing binary arithmetic utilizing operational amplifiers and differential comparators. An operational amplifier provides an analog signal from logic level inputs representative of binary ones or zeroes. Differential comparators compare the analog voltage to reference voltages and provide output logic levels dependent on the result of the comparison. A single bit sum is defined as being "one" when there are an odd number of logic "ones" at the input. Carry-out is defined as being "one" whenever any two or more inputs are logic "ones."

3,728,532
CARRY SKIP-AHEAD NETWORK

Richard Lee Pryor, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.J.

Filed Jan. 21, 1972, Ser. No. 219,719
Int. Cl. G06f 7/50
U.S. Cl. 235—175 6 Claims

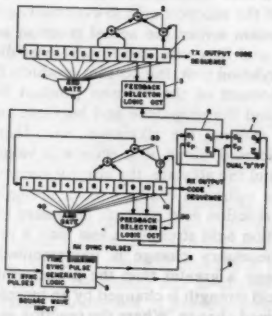
A network for use with arithmetic units such as adder circuits wherein a large number of bits are added together. Provision is made for evaluating the added bits in conjunction with the carry-in signal supplied to the adder so that the carry signal may be "skipped ahead," i.e. passed over, one or more adder circuit segments in order to avoid the delay of propagating a carry signal through each adder circuit segment in the arithmetic unit.



3,728,533
CIRCUIT FOR AVOIDING FALSE LOCK

Solomon Bertram Matthews, Montreal, Quebec, Canada, assignor to Canadian Marconi Company, Montreal, Quebec, Canada

Filed Aug. 16, 1971, Ser. No. 171,971
Claims priority, application Canada, Sept. 23, 1970, 094,050
Int. Cl. G06f 15/34; G01s 7/28
U.S. Cl. 235—181 4 Claims



It is well known that the autocorrelation function of a psuedo-random sequence, multiplied by itself delayed, theoretically consists of one peak at zero delay and approximately zero amplitude at all other delays. It is also known that, in practice, there are second order effects which give rise to secondary peaks at delays other than zero. In a system such a pseudo-randomly phase modulated radar altimeter, which utilizes the autocorrelation peak to lock on and track, the appearance of secondary peaks may cause false locks. The instant invention is directed at means for avoiding false locks, and comprises means for altering the pseudo-random sequences of the modulating code generator and the tracking code generator at a predetermined rate. The timing of the alteration is such that the sequence of the modulating code generator will be altered only when there exists in the modulating code generator a predetermined word, e.g., the all ones

state. The sequence of the tracking code generator is altered the first time that the same predetermined word exists in the tracking code generator after the sequence of the modulating code generator has been altered.

3,728,534
CONSTRUCTABLE LOGIC SYSTEM

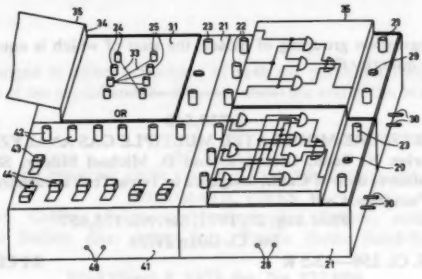
Uwe Bertram; Rolf Isernhagen, both of Hamburg; Hans Neuhaus, Norderstedt; Jurgen Schwandt, and Ludolf Stewen, both of Hamburg, all of Germany, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed July 30, 1971, Ser. No. 167,634

Claims priority, application Germany, Feb. 10, 1971, P 21 06 257.7

Int. Cl. G06f 7/48; H03k 19/36

U.S. Cl. 235—184 **6 Claims**



A constructable logic system comprising a plurality of connective circuit blocks. Each of said blocks having identical circuit logic elements. Each circuit can be individually programmed by uniquely connecting the logic elements to form an individual logical function for the circuit.

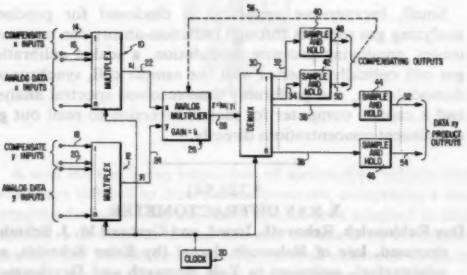
3,728,535
MULTI-CHANNEL ANALOG MULTIPLIER AND SYSTEMS

Allen C. Dickman, North Tonawanda; Theodore L. Roess, and George R. Mathewson, both of Williamsville, all of N.Y., assignors to Textron Inc., Providence, R.I.

Filed Aug. 19, 1971, Ser. No. 173,119

Int. Cl. G06g 7/16; G06j 1/00

U.S. Cl. 235—194 **11 Claims**



A single analog multiplier is used to obtain the products of many pairs of analog signals. The many pairs of analog signals are connected to the multiplier on a time-sharing basis by cyclically sampling the analog signals and applying them in repetitive sequence to the analog multiplier. Conventional multiplexing techniques are used for this purpose. The successive output signals of the multiplier are then demultiplexed and the amplitudes of the product signals are separately stored to provide the system output. The accuracy of the multiplication is constrained to be very high by repetitively correcting the output of the multiplier according to the product obtained from one or more pairs of analog signals whose products should be fixed and are known references. By suitably operating upon the multiplier outputs, many additional functions such as scaling, filtering, square root extraction, division, etc. may be obtained.

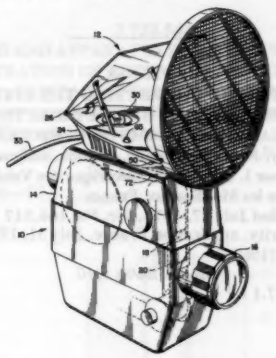
3,728,536
PHOTOGRAPHIC LIGHTING UNIT

Philip G. Baker, Peabody, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 20, 1971, Ser. No. 145,268

Int. Cl. G03b 15/02

U.S. Cl. 240—1.3 **16 Claims**



A lighting unit, particularly adapted for use in motion picture photography, employing a reflector element and a screen-like lens displaceably mounted for movement between a storage position overlying and in close proximity to the source of illumination and an operable position spaced from the source. The reflector element and the lens are pivotally mounted on a platform-like base, which is adapted to receive an incandescent lamp, for pivotal motion from a first position overlying and in close proximity to the platform to a second position wherein at least a major portion of both are spaced from the platform so as to provide a suitable optical path between the source and the lens. A switch, mounted on the platform for engagement by the lens when it is in its closed position, is adapted to interrupt the electrical circuit and thereby prevent energization of the source of illumination when the unit is in its stored condition.

3,728,537
ARRANGEMENT OF FRONT AND/OR REAR LIGHTS OF MOTOR VEHICLES

Bela Barenyi, Maichingen; Hermann Renner, Boblingen, and Bruno Sacco, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Aug. 25, 1969, Ser. No. 852,751

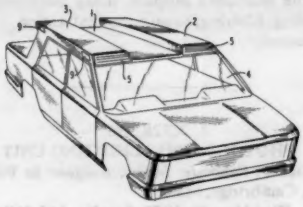
Claims priority, application Germany, Aug. 28, 1968, P 17 80 299.2

Int. Cl. B60q 3/00

U.S. Cl. 240—7.1 **24 Claims**

An arrangement for the front and/or rear lights of motor vehicles in which longitudinal bearers are provided within the

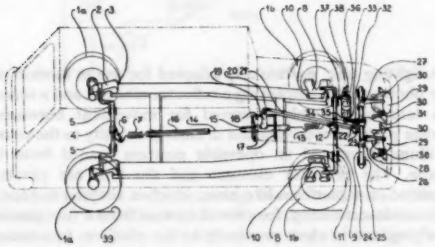
area of the lateral edges of the roof which accommodate in the front and rear end faces thereof the front and/or rear lights of the vehicle.



3,728,538
APPARATUS FOR CORRECTING THE EFFECT OF VARIATION IN LOAD ON THE DIRECTION OF HEADLIGHT BEAMS OF VEHICLES

Francois Bailly, Neuilly-sur-Seine, France, assignor to Societe Anonyme Pour L'Equipment Electrique des Vehicules S.E.V. Marchal, Issy les Moulineaux, France

Filed July 27, 1971, Ser. No. 166,517
Claims priority, application France, July 31, 1970, 7028356; Feb. 26, 1971, 7106705
Int. Cl. B60q 1/10
U.S. Cl. 240—7.1 LJ 7 Claims



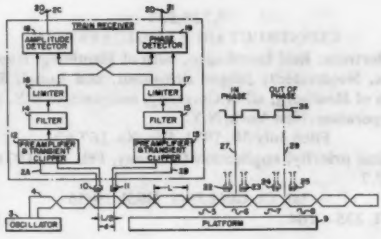
A system or apparatus for correcting the effect of variation in load on the direction of headlight beams of vehicles whereby the position of the headlights is automatically varied in response to changes in distribution of load when the vehicle is empty, lightly loaded or heavily loaded, or during braking or acceleration.

3,728,539
METHOD AND APPARATUS FOR CONTROLLING A VEHICLE CONTROL SIGNAL

George M. Thorne-Booth, Tarzana, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 8, 1971, Ser. No. 132,379
Int. Cl. B61l 3/12
U.S. Cl. 246—182 B 8 Claims

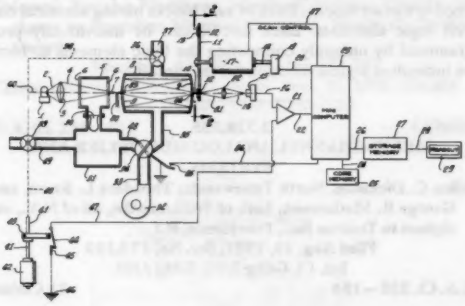
A vehicle traveling along a vehicle travel path is provided a deceleration signal which is proportional to the quantity $K2/Dt^3$, where D is the distance the vehicle has to travel to a stopping position, t is a time reference relative to how long it takes the vehicle to travel the distance D, and K2 is an operational constant determined by system parameters. The quantity t^3 is computed by generating a predetermined number progression grouping of pulses, the sum of which is equal to the quantity t^3.



3,728,540
PRESSURE-MODULATED MULTIPLE GAS ANALYZER

Marion N. Todd, Glendora, and D. Michael Milder, Sierra Madre, both of Calif., assignors to Tetra-Tech Incorporated, Pasadena, Calif.

Filed Aug. 27, 1971, Ser. No. 175,657
Int. Cl. G01n 21/26
U.S. Cl. 250—43.5 R 11 Claims



Small, inexpensive apparatus is disclosed for precisely analyzing gas samples through radiation-absorption measurements, employing pressure modulation, a sealed calibration gas cell optically in series with the sample cell, synchronous demodulation, and preferably time-resolved spectral analysis and a captive computer for matrix inversion to read out gas constituent concentrations directly.

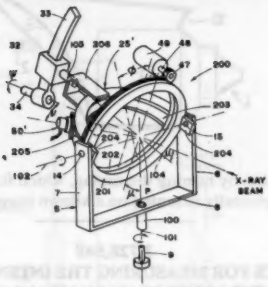
3,728,541
X-RAY DIFFRACTOMETER

Dov Rabinovich, Rehovoth, Israel, and Gerhard M. J. Schmidt, deceased, late of Rehovoth, Israel (by Ester Schmidt, administrator), assignors to Yale Research and Development Co., Ltd., Rehovoth, Israel

Continuation-in-part of Ser. No. 37,202, May 14, 1970, abandoned. This application Jan. 5, 1972, Ser. No. 215,486
Claims priority, application Israel, May 20, 1969, 32247
Int. Cl. G01n 23/20
U.S. Cl. 250—51.5 14 Claims

An X-ray diffractometer has a yoke on which a crystal is mounted so that a particular rational axis thereof intersects the axis of the X-ray beam at a predetermined angle. A direct counting detector mounted on the yoke is selectively posi-

tionable in both azimuth and elevation with respect to the particular rational axis of the crystal. The yoke is constructed and



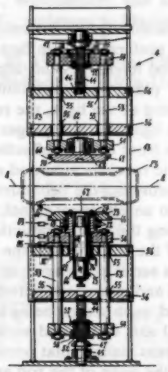
arranged to effect precession of both the particular rational axis of the crystal and the detector about the axis of the beam.

3,728,542

EQUIPMENT UNIT FOR X-RAY INSPECTION OF PNEUMATIC TIRES

Leon Golfier, Soisy-sous-Montmorency, France, assignor to Societe dite: Jubin S.A., Pantin (Seine Saint-Denis, France

Filed March 8, 1972, Ser. No. 232,896
Claims priority, application France, March 11, 1971, 7108459
Int. Cl. G03b 41/16
U.S. Cl. 250—52 10 Claims



A unit for the X-ray inspection of automotive vehicle tires which are inflated to their normal pressure, comprising a tire-gripping device having angularly spaced jaws adapted to slide radially with respect to the tire and mounted on a handling carriage for transferring tires from a feed conveyor to an inspection apparatus and then to a discharge conveyor.

The inspection apparatus comprises rotary discs mounted on a support for translational motion towards or away from the tire, annular shoulders being formed on the discs for pressure-tight engagement within the beads of tires of different sizes so as to define an enclosure which permits inflation with compressed air, an X-ray generating tube mounted within a sheath which is capable of passing through one disc in leak-tight manner, and a drive system for rotating the tire to be inspected.

3,728,543

THERMOLUMINESCIENCE OF SAPPHIRE

William Gordon Buckman; David C. Sutherland, and David W. Cooke, all of Bowling Green, Ky., assignors to The United States of America as represented by the Secretary of Department of Health, Education and Welfare

Filed Nov. 23, 1971, Ser. No. 201,458
Int. Cl. G01f 1/11
U.S. Cl. 250—71 R 6 Claims

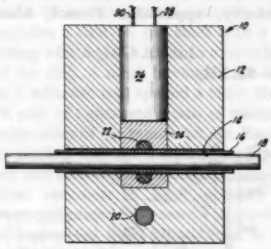
A novel technique and dosimetric material is disclosed for the detection and measurement of ultraviolet radiation. Nominally pure sapphire containing trace impurities such as manganese, chromium, iron and titanium is ground into a powder form of approximately 200 mesh particle size. The sapphire is then excited with incident ultraviolet radiation and subsequently heated whereby the sapphire thermoluminesces. The intensity of the resulting luminescence is a measure of the ultraviolet radiation dosage to which the sapphire has been exposed.

3,728,544

METHOD AND APPARATUS FOR MEASUREMENT OF CONCENTRATION OF THERMAL NEUTRON ABSORBER CONTAINED IN NUCLEAR FUEL

Samuel Untermyer, Portola Valley, Calif., assignor to National Nuclear Corporation, Palo Alto, Calif.

Filed July 24, 1970, Ser. No. 58,039
Int. Cl. G01t 3/00
U.S. Cl. 250—83.1 5 Claims



Nuclear fuel samples containing burnable poisons are irradiated with epithermal neutrons and the neutron emission rate is counted to provide a measurement of fissile content through comparisons with the results of like steps performed on reference fuels. Where the fissile content is known, poison content is determined through irradiation of the sample with thermal neutrons. The presence of the poisons depresses the thermal neutron flux within the fuel and reduces the number of fission neutrons emitted. This emission rate is compared with the results of like steps performed on reference rods to indicate poison content. In another embodiment gamma emission by the fissile species is used in conjunction with thermal neutron interrogation to measure both fissile and absorber content.

3,728,545

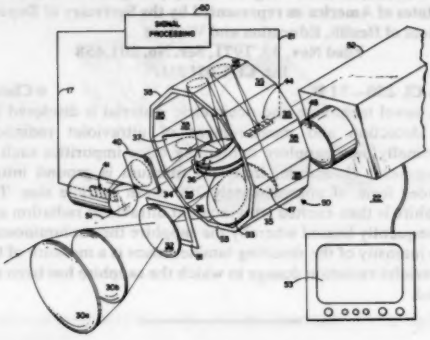
INFRARED IMAGING APPARATUS

Irving R. Abel, Lexington, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed April 28, 1971, Ser. No. 138,085
Int. Cl. G01t 1/24
U.S. Cl. 250—83.3 HP 16 Claims

An infrared scanning system comprising input optics including objective and field lenses, output optics including a relay lens and a linear array of detectors, a scanner including a hollow inwardly reflecting polygonal prism rotated about its longitudinal axis, which is aligned with the axis of the input op-

tics, and further optical components including a relay lens, a strip mirror, and first and second folding mirrors, which are



contained within the outline of the prism, and with respect to which the prism rotates.

3,728,546

COMPENSATING ARRANGEMENT FOR THERMAL DETECTORS

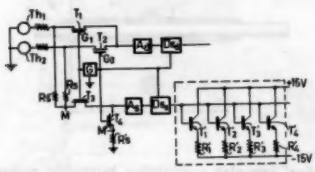
Francois Desvignes, Bourg-la-Reine, and Francois-Xavier Doittau, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed March 22, 1972, Ser. No. 237,178

Claims priority, application France, March 23, 1971, 7110179

Int. Cl. G01j 1/10

U.S. Cl. 250—83.3 H **5 Claims**



Compensation of radiation towards outer space for horizon sensor thermopiles.

Electronic circuit elements which form part of the device for controlling the compensating source are incorporated in a metallic material which consequently radiates to the thermopiles a thermal power which is proportional to the power which passes through these elements. Thus substantially all the power consumed is used in this source, so that the power consumption is reduced to a minimum. Applications for compensation of radiation towards outer space which gives rise to zero errors in the case of differences in sensitivity between the detectors in the attitude sensors.

3,728,547

AN X-RAY APPARATUS AND AN OPERATION LIGHTING

Sven Vilhelm Emanuel Lundin, Satravagen 25, Sweden, assignor to Humanteknik AB, Stockholm, Sweden

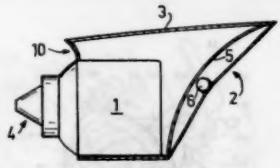
Filed April 6, 1970, Ser. No. 25,741

Claims priority, application Sweden, April 22, 1969, 5696/1969

Int. Cl. H01j 35/16

U.S. Cl. 250—90 **1 Claim**

The invention concerns a device, especially for dentists, comprising an X-ray apparatus and an operation lighting. According to the invention these two means are mounted in a common casing. In this casing the two means are facing two different directions, so that each of them can be brought into



active position by turning the casing, which for this purpose is preferably pivotally mounted on a known supporting arm.

3,728,548

DEVICE FOR MEASURING THE INTENSITY OF A SCANNING LIGHT BEAM BY MEANS OF A LIGHT CONDUCTING ROD

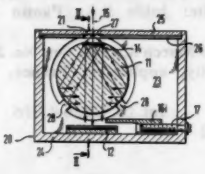
Gernot Pinior, 8034 Germering, Germany, assignor to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed March 23, 1972, Ser. No. 237,363

Claims priority, application Germany, April 1, 1971, P 21 15 979.5; Oct. 11, 1971, P 21 50 634.3

Int. Cl. G02b 5/14; H01j 5/16, 3/14

U.S. Cl. 250—217 R **14 Claims**



A device for measuring the intensity of a scanning light beam moving in a preferably plane face, having a transparent light-conducting rod having a front and back end and being mounted in said plane face substantially parallel to the direction of scanning of the light, the rod conducting at least one portion of the light which impinges thereupon and enters therein toward the front end by reflecting on the walls of said rod; a photoelectric receiver mounted adjacent the front end of the rod for transforming the light current reaching the front end of the rod into an electrical signal; a light-reflecting surface extending along the light-conducting rod in spaced relation on the side of the rod opposite the area of light impingement on the rod; a series of separate screens extending along the axis of the rod and interposed between the light reflecting surface and the rod, each screen being adjustable transversely of the longitudinal axis of the rod such that each screen influences in a different manner that portion of the light emerging laterally from the walls of the rod and reflected back into the rod by the light reflecting surface according to the adjustment of the respective screen as to the portion of the light reflecting surface exposed to the rod and not blocked by the screen according to the adjustment of the screen.

3,728,549

IN SITU DEVICE FOR MEASURING LIGHT SCATTERING

Peter L. Sachs, Falmouth, Mass., assignor to The United States of America as represented by the Secretary of the Navy

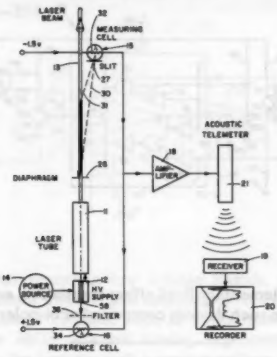
Filed April 12, 1972, Ser. No. 243,140

Int. Cl. G01n 21/26

U.S. Cl. 250—218 **7 Claims**

A self-contained, telemetering, fixed small angle forward scatterance meter for furnishing real-time data on light scattering intensity is provided. Collimated light from a laser is directed through the water, scattered light reaching a photosensitive surface which is offset from the axis of the laser

beam a selected short distance. Variations in ambient temperature and laser intensity are compensated for by a reference photocell which is matched to the measuring cell. Data representative of light scattering is continuously telemetered and received and recorded at a remote location. This data provides a continuous profile of readings related to the concentration of matter in suspension as determined by gravimetric analysis of samples collected while the device is disposed in the medium.

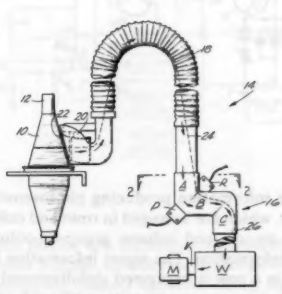


3,728,550

DEVICE AND METHOD FOR DETECTING AND WITHDRAWING A PREDETERMINED LENGTH OF YARN

Luther A. Cleland, Jr., Westminster, and Albert D. Harmon, Clemson, both of S.C., assignors to Maremont Corporation, Chicago, Ill.

Filed Oct. 20, 1971, Ser. No. 190,741
Int. Cl. B65h *69/04*; G01n *21/30*
U.S. Cl. 250—219 S **10 Claims**



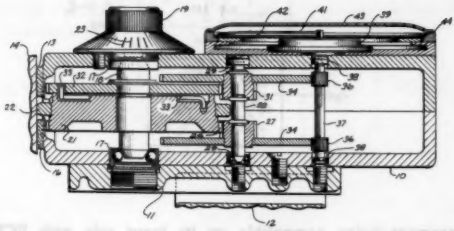
The device and method disclosed employ a conduit with a bend and preferably a double bend intermediate its ends through which yarn is moved, as by currents of air from a vacuum pump; adjacent the bend or the upstream bend of the double bend a photoprojector and photoreceiver switch detect the presence of yarn at the short-turn of that yarn being drawn thereacross and interrupting the beam of light therebetween to detect a predetermined length of yarn whereupon the photoreceiver switch deactivates the means used to draw yarn through the conduit and thereby establishes a predetermined length of yarn. The device and method are usefully employed with yarn piecers and knotters to avoid excessive yarn wastage and to insure that sufficient yarn is provided to effect piecing or knotting.

3,728,551

MASK ADJUSTMENT MECHANISM

Irven H. Culver, Playa del Rey, and Ronald C. Sheltra, West Los Angeles, both of Calif., assignors to Southwestern Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 868,436, Oct. 22, 1969, Pat. No. 3,628,038. This application May 19, 1971, Ser. No. 144,919
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 SE **11 Claims**



A distance measuring system is described in which a wheel is frictionally engaged with a surface along which measurements are made. The metering wheel is connected to a shaft which drives a portion of a photoelectric chopper which provides an indication of increments of metering wheel travel. The chopper includes a disk on the shaft with a plurality of windows alternating with opaque areas in a circular path near the periphery of the disk. A mask having an arc of somewhat similar windows is adjacent and spaced a short distance away from the disk. A pair of lights and a pair of photosensors are located on opposite sides of the mask-disk set. Each photosensor detects light passing through a different plurality of windows in the mask and disk and, as the disk rotates, a substantially symmetrical variation in light intensity occurs. A minimum area non-collimated light source is provided and the mask is located nearer the light source than is the disk. A greater number of windows per unit length is provided on the mask than on the disk so that successful chopping of a non-collimated light beam is obtained when the mask and disk are spaced apart. The mask is mounted on a ring movable by an eccentric and constrained to move only angularly about its center and along a direction normal to a chord between the two photosensors. This permits the phase relation between the photosensor inputs to be adjusted readily and with high precision. Precise adjustment of phase relation and proper mask and disk construction permit the chopper to give usable signals at very high slue rates.

3,728,552

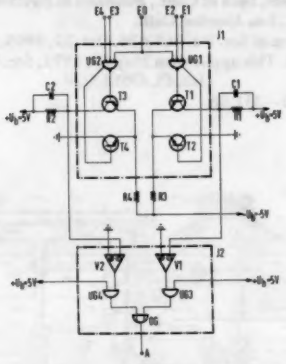
CONTROL DEVICE FOR A SELECTIVE MATRIX OF A DATA MEMORY WITH SELECTIVE ACCESS

Hermann Kadow, Vaterstetten, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 7, 1972, Ser. No. 232,423
Claims priority, application Germany, March 30, 1971, P 21 15 453.0
Int. Cl. H03k *19/08*, *19/22*
U.S. Cl. 307—208 **1 Claim**

A control device for a selective matrix of a data memory employs RC circuits to simulate the thermal behavior of the selection circuits, a threshold circuit for evaluating a thermal limit which is critical for the selection circuits, a first integrated circuit component designed as a potential converter which forms the input stage of two parallel connected control

signal generators and a second integrated component which functions as a double difference comparing circuit, the arrangement being compatible on its input side with ECL techniques and on its output side with TTL techniques.

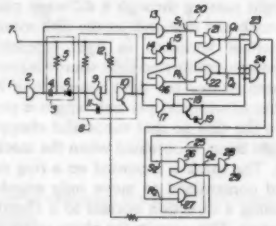


3,728,553

SPEED DETECTING SYSTEM UTILIZING DIGITAL LOGIC CIRCUITRY

Hisato Wakamatsu, and Shigeyuki Akita, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

Filed July 29, 1971, Ser. No. 167,277
Claims priority, application Japan, Aug. 3, 1970, 45/67924
Int. Cl. H03k *5/20;* **G01p** *3/56*
U.S. Cl. 307—231 **2 Claims**



A speed detecting system for vehicles for detecting whether the instantaneous vehicle speed has reached a preset reference vehicle speed in terms of signals "1" and "0". In this system, the instantaneous vehicle speed is converted into a digital signal, and the entire operation is digitally performed.

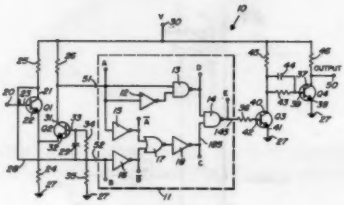
3,728,554

MICROPOWER ZERO-CROSSING DETECTOR

Harry A. Kuhn, Jr., Phoenix, and James W. Foltz, Scottsdale, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed April 17, 1972, Ser. No. 244,489
Int. Cl. H03k *5/18*
U.S. Cl. 307—233 **7 Claims**

A pulse is produced at the output of a detector in response to the zero crossings of an analog electronic signal input up to a predetermined input frequency. When that frequency level is exceeded, an indicator voltage level is produced at the output. The apparatus for producing the output pulses and the indicator voltage level is comprised of complementary field effect transistors, requiring very little power. The input of the device is a bi-polar transistor type differential amplifier, the combination providing a zero crossing detector having a much higher frequency response than such a device comprised entirely of complementary field effect transistors, and requiring less power than such devices comprised of bi-polar transistors.

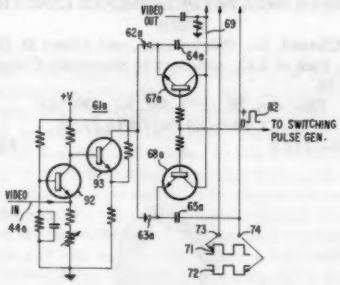


3,728,555

SIGNAL TRANSFER SYSTEM FOR PANEL IMAGE SENSOR

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 72,944, Sept. 17, 1970. This application March 29, 1972, Ser. No. 239,080
Int. Cl. H03k *17/00*
U.S. Cl. 307—246 **8 Claims**



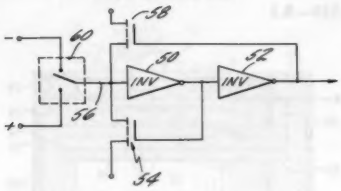
The image information producing photosensitive elements of the sensor, which are arranged in rows and columns, are addressed row-by-row and column group-by-column group to decode the information. The signal information from a group of elements in a row is impressed simultaneously upon a like group of signal processing circuits, with each of which is associated a pair of signal storage devices, each having an input gate and an output gate. The input gates for one set of corresponding storage devices are concurrently operated to impress a group of signals simultaneously upon these storage devices during a given time period while the output gates for the other set of corresponding storage devices are operated sequentially to transfer the signals stored in the other set of storage devices to the output circuit. The operation of the input and output gates is reversed in the succeeding time period and this alternating operation continues until the information from all of the sensor elements is transferred to the output circuit.

The invention herein was made in the course of or under contract or subcontract thereunder with the Department of the Air Force.

3,728,556
REGENERATIVE FET CONVERTER CIRCUITRY

Clifford G. Arnell, Warminster, Pa., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 24, 1971, Ser. No. 201,678
Int. Cl. H03k 17/60
U.S. Cl. 307—251 6 Claims

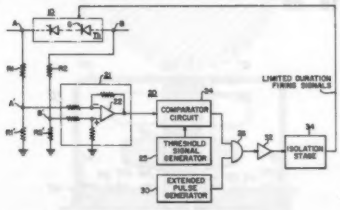


A converter receiving low voltage signals, such as from bipolar transistor circuits and applying corresponding signals to higher voltage circuits, such as MOS transistor circuits, comprises a MOS inverter having regenerative feedback which drives the inverter with a greater voltage than that supplied thereto by the bipolar circuits. This results in positive switching which reduces switching time, avoids race conditions, and eliminates switching ambiguities which result from high noise/signal line conditions. In one embodiment, regeneration provides latching in either of two stable states.

3,728,557
CONTROL SCHEME FOR TIMING THE APPLICATION OF LIMITED DURATION FIRING SIGNALS TO POWER SWITCHING DEVICES

Brian R. Pelly, Murrysville, and Mario G. Tarjan, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1972, Ser. No. 219,461
Int. Cl. H03k 17/56
U.S. Cl. 307—252 N 4 Claims



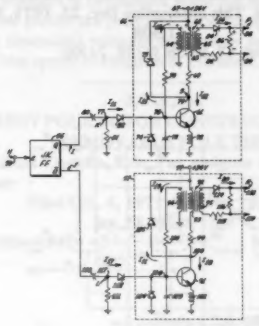
The invention relates to a technique for monitoring the forward and reverse voltage conditions across power switching devices and applying limited duration firing signals to the power switching devices during the forward blocking voltage conditions.

3,728,558
SYNCHRONIZED TRIGGER GENERATORS FOR USE WITH A SWITCHING REGULATOR

Luther L. Genuit, Scottsdale, and John R. Nowell, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 20, 1971, Ser. No. 190,860
Int. Cl. H03k 3/30
U.S. Cl. 307—262 7 Claims

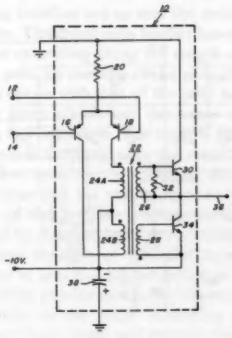
A JK flip-flop provides signals to alternately trigger first and second transistor blocking oscillators which supply trigger signals for a switching regulator. Each of the blocking oscillators uses a capacitor between the transistor base and ground to reduce the effects of noise signals and uses an inductor in the transistor emitter circuit to prevent high frequency oscillations.



3,728,559
HYBRID HIGH SPEED ECL TO P-CHANNEL MOS CLOCK DRIVER

John C. Spann, Baltimore, and James F. Gentry, Prince Georges, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 26, 1971, Ser. No. 202,437
Int. Cl. H03k 1/14, 5/02
U.S. Cl. 307—264 7 Claims



A voltage level shifting circuit which can be used as a high speed MOS clock driver, for example, driven by any emitter-coupled, non-saturated logic device. This is achieved, among other things, by the use of transformer coupling which offers isolation, minimal power requirements, and maximum efficiency. At the same time, the circuitry permits hybrid circuit packaging. The circuit has a broad frequency range and minimal rise and fall times for digital signals while feeding into a capacitive load.

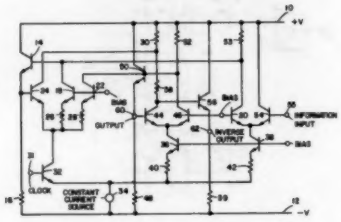
3,728,560
BISTABLE MULTIVIBRATOR CIRCUIT

Ronald L. Treadway, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation-in-part of Ser. No. 110,863, Jan. 29, 1971, abandoned, Continuation-in-part of Ser. No. 110,932, Jan. 29, 1971, abandoned. This application Dec. 23, 1971, Ser. No. 211,508

Int. Cl. H03k 3/286, 21/06

U.S. Cl. 307—289 9 Claims



A bistable multivibrator circuit which is readily adaptable to monolithic integrated circuit technology combines the master and slave portions, reducing the components needed to provide a master/slave circuit operation when the multivibrator is used either as a frequency divider or as a gated logic circuit.

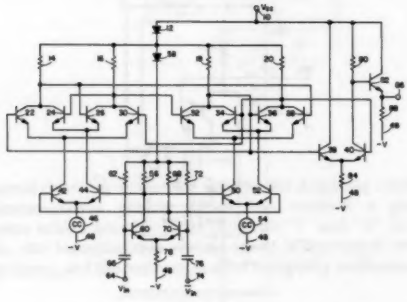
3,728,561
HIGH SPEED MASTER-SLAVE FLIP-FLOP FREQUENCY DIVIDER

Bernard D. Brocker, Jr., Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 111,869, Feb. 2, 1971, abandoned. This application Jan. 12, 1972, Ser. No. 217,396

Int. Cl. H03k 3/286

U.S. Cl. 307—291 9 Claims



A frequency divider capable of operating at frequencies in the order of 1 gigaHertz has a master flip-flop and a slave flip-flop. Both the master and the slave flip-flops are provided with a transistor gate circuit, the master flip-flop being directly connected to the gate circuit associated with the slave flip-flop, and the slave flip-flop being directly connected to the gate circuit associated with the master flip-flop. A switching circuit, responsive to an input electronic waveform, permits the transfer of the contents of the master flip-flop to the slave flip-flop when the input waveform is of one polarity. When the input waveform is of the other polarity, the switching circuit permits a transfer of the inverse of the slave flip-flop contents.

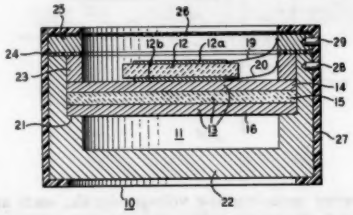
3,728,562
ELECTROACOUSTIC TRANSDUCER HAVING TRANSDUCING ELEMENT SUPPORTING MEANS

Robert Joseph Herson, Ocean Township, and Sotirios Constantine Kitsopoulos, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1971, Ser. No. 190,208

Int. Cl. H01v 7/00

U.S. Cl. 310—9.1 10 Claims



An electromechanical transducer element is supported within a transducer housing by a trilaminar diaphragm comprising a layer of viscoelastic material sandwiched between a pair of rigid plates. By locating the neutral bending plane of the composite diaphragm-element structure in the center layer of viscoelastic material, where shear stresses are maximal, the resultant shear deformation in the viscoelastic material advantageously dissipates vibratory energy. This provides a means of reducing undesirable peaks in the transducer's frequency response and results in a more uniform response characteristic.

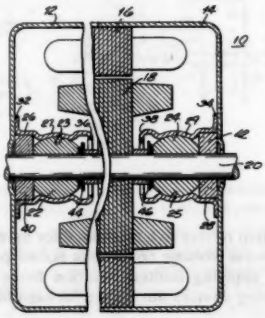
3,728,563
BEARING SUPPORT AND OIL RETAINER FOR DYNAMO-ELECTRIC MACHINES

Thomas W. Stone, Owosso, Mich., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Aug. 23, 1971, Ser. No. 173,807

Int. Cl. H02k 5/16

U.S. Cl. 310—90 7 Claims

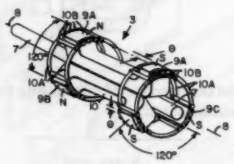


A tubular member has an elongated body with a flange at one end attached to the end frame of a dynamoelectric machine and its opposite end having an inturned lip. One or more spherical bearings are positioned within the tubular body and the tubular body is shaped to engage the outer spherical surfaces of the bearing, or bearings, to hold the bearing in place. The tubular body is preferably shaped to conform to the outer bearing spherical surfaces by pulse forming with a magnetic coil. An oil retaining body is also positioned within the tubular body. The bearing support arrangement is utilized with a through shaft construction and a unit bearing construction.

3,728,564
ELECTROMECHANICAL ENERGY CONVERSION DEVICE

John De Rugeris, 695 Kenneth Avenue, Campbell, Calif.

Filed Feb. 3, 1971, Ser. No. 153,462
Int. Cl. H02k 17/42
U.S. Cl. 310—168 17 Claims

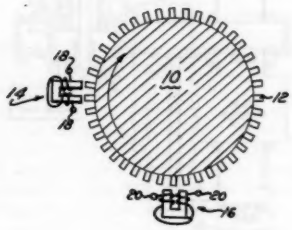


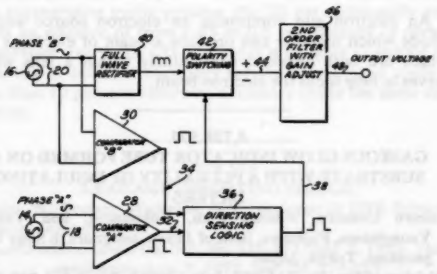
An electromechanical energy conversion device including a magnetic field source and armature structure movable relative to one another, said device being adapted to convert mechanical energy to electrical energy as the field and armature travel relative to one another along a given path and to simultaneously convert electrical energy to mechanical energy to facilitate said travel.

3,728,565
DEVICE FOR SENSING THE DIRECTION AND SPEED OF A SHAFT

Gerald F. O'Callaghan, Kenosha, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed July 21, 1971, Ser. No. 164,685
Int. Cl. H02k 19/20; G08b 21/00
U.S. Cl. 310—168 19 Claims



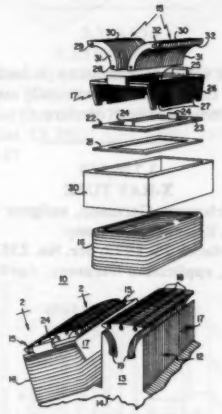


A device for sensing the direction of rotation and the speed of a shaft includes a two-phase AC generator having a rotor attachable to the shaft and rotatable therewith and first and second spaced apart stator windings. The first and second stator windings are adapted to have first and second sinusoidal voltages established thereacross respectively, in response to rotation of the rotor with the shaft. The first sinusoidal voltage is adapted to lead the second sinusoidal voltage when the shaft rotates in a first direction and the second sinusoidal voltage is adapted to lead the first sinusoidal voltage when the shaft rotates in a direction opposite the first direction. A logic circuitry is provided for determining which of the first and second sinusoidal voltages is leading the other of the first and second sinusoidal voltages to thereby determine the direction of rotation of the shaft. The magnitude of the first and second sinusoidal voltages is dependent upon the speed of rotation of the shaft and means are provided for sensing the magnitude of one of the sinusoidal voltages to provide an output signal indicative of the speed of rotation of the shaft.

3,728,566
SALIENT POLE ROTOR CONSTRUCTION WITH REMOVABLE POLE TIPS

Charles Albert Costello, Erie, Pa., assignor to General Electric Company

Filed Oct. 4, 1971, Ser. No. 186,349
Int. Cl. H02k 1/24
U.S. Cl. 310—194 7 Claims



A salient pole rotor construction which has removable pole tips to facilitate assembly and disassembly of the rotor. The removable pole tip is so constructed that centrifugal forces produced during rotation act to seat the pole tip more firmly to the rotor pole. The rotor pole bodies have an arcuate pole tip retaining slot extending along the length of the pole body. The removable pole tip consists of the pole tip portion having a surface which mates with that of the pole surface and an arcuate retaining stem which has the same curvature as the retaining slot in the pole shoe. The rotor is assembled by positioning a pre-formed field coil over the rotor core and then attaching the salient pole tips by inserting the arcuate stem in the retaining slot to lock the coil in place and retain it in position. By virtue of the arcuate configuration, the centrifugal forces generated by rotation force the arcuate stem of the pole tips firmly against the side of the slots thereby utilizing the centrifugal force to seat the salient pole tips firmly. By virtue of this construction, pre-formed field coils may be used simplifying the assembly of the rotor. Assembly time is reduced, while at the same time, scrap and rework losses are cut down producing highly desirable cost savings.

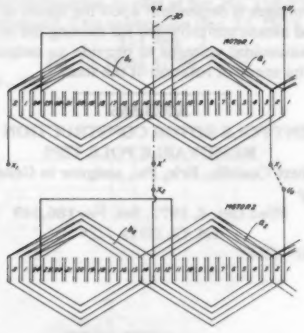
3,728,567
WINDINGS FOR MULTIPLE-MOTOR UNIT

Ernst Picmaus, 6710 Frankenthal/Pfalz, Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal/Pfalz, Germany

Filed Sept. 24, 1971, Ser. No. 183,506
Claims priority, application Germany, Sept. 30, 1970, P 20 48 063.1
Int. Cl. H02k 3/00
U.S. Cl. 310—198 5 Claims

At least two electric motors are connected for operation in unison and each has a winding carrier provided with a plurali-

ty of grooves. A winding is provided on each of the carriers and comprises n conductors in at least one of the grooves of one of the carriers and $n+1$ conductors in the remaining ones



of the grooves. A separate conductor is located in the one groove of the one carrier and is electrically conductively connected with the windings of both carriers.

3,728,568

X-RAY TUBE

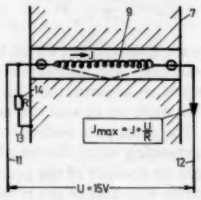
August Lenert, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed March 16, 1972, Ser. No. 235,219

Claims priority, application Germany, April 24, 1971, P 21 20 160.5

Int. Cl. H01j *35/06*

U.S. Cl. 313—60 **3 Claims**



An X-ray tube has a glow cathode which is surrounded by a focussing device electrically connected therewith. The invention is particularly characterized in that the connection of the cathode with the Wehnelt cylinder serving as the focussing device includes a current limiting resistance.

3,728,569

CATHODE-RAY TUBE

Jan Gerritsen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

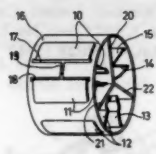
Filed Sept. 24, 1971, Ser. No. 183,586

Claims priority, application Netherlands, Sept. 17, 1970, 7013722

Int. Cl. H01j *29/76*

U.S. Cl. 313—79 **5 Claims**

A cathode-ray tube in which a number of electron beams are produced. The tube comprises a luminescent screen and, at a short distance therefrom, a color selection electrode. The electron beams are converged by means of a magnetic convergence device. The part of the convergence device present inside the tube comprises for each electron beam a pair of plate-shaped pole shoes. Each pole shoe is provided in a cylindrical part of the convergence device through an axial gap. The cylindrical part of the convergence device furthermore comprises gaps in such manner that it holds for each axial gap that no closed electric connection exists around a single gap. As a



result of this the occurrence of circulating currents around the axial gaps is counteracted.

3,728,570

ELECTRON PROBE FORMING SYSTEM

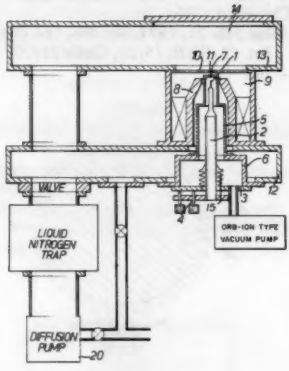
Kenneth Charels Arthur Smith, and David John Swann, both of c/o The Department of Engineering, University of Cambridge, Trumpington St., Cambridge, England

Continuation of Ser. No. 866,317, Oct. 14, 1969, abandoned. This application Nov. 18, 1971, Ser. No. 199,899

Claims priority, application Great Britain, April 29, 1969, 21,770/69

Int. Cl. H01j *1/30*

U.S. Cl. 313—84 **6 Claims**



An electron gun comprising an electron source and an anode which together can produce a beam of electrons and which are both disposed substantially within a lens which serves to help focus the electron beam.

3,728,571

GASEOUS GLOW INDICATOR TUBE FORMED ON A SUBSTRATE WITH A PLURALITY OF INSULATING LAYERS

Saburo Uemura, Kanazawa-ku, Yokohama, and Yuzuru Yanagisawa, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

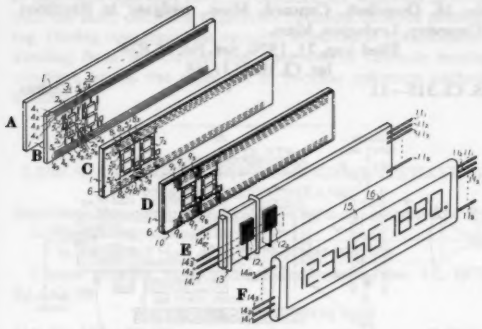
Division of Ser. No. 741,668, July 1, 1968, Pat. No. 3,588,571. This application June 22, 1971, Ser. No. 155,555

Int. Cl. H01j *61/66*

U.S. Cl. 313—109.5 **9 Claims**

A gaseous glow indicator tube including a method of manufacturing and aging in which the elements of the indicator electrodes are arranged in a single plane by plating conducting segments on a base insulating plate which also carries a plurality of element energizing electrodes. The various elements of the indicator elements are individually connected to the energizing electrodes. Anode electrodes are mounted ad-

jacent the indicator electrodes and are connected to anode energizing leads so as to selectively energize various indica-



tions. A method for aging the gaseous glow indicator is also disclosed.

3,728,572

INCANDESCENT LAMP WITH REGENERATIVE CYCLE

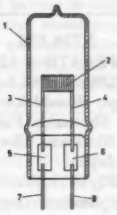
Gerhard Maier, and Siegfried Henes, both of Herbrechtingen, Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlamper mbH, Munich, Germany

Filed July 30, 1971, Ser. No. 167,631

Claims priority, application Germany, Sept. 18, 1970, P 20 46 186.3

Int. Cl. H01k *1/50*

U.S. Cl. 313—222 **1 Claim**



Halogen incandescent lamp with tungsten filament contains inert fill gas and has a partial bromine pressure sufficient for the regenerative cyclic process; the fill gas additionally contains an additive of from 0.05 to 0.5 vol. percent of carbon monoxide; due to the CO additive it is possible to reduce the quantity of bromine necessary for the regenerative cycle to less than 10 percent otherwise necessary under the same conditions.

3,728,573

LEAKAGE INHIBITING SHIELD

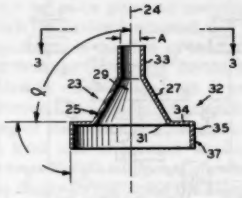
Henry W. Roeber, Waterloo, N.Y., assignor to GTE Sylvania Incorporated

Continuation-in-part of Ser. No. 216,111, Jan. 7, 1972. This application Aug. 3, 1972, Ser. No. 277,617

Int. Cl. H01j *1/52, 61/04*

U.S. Cl. 313—313 **8 Claims**

An improved shielding means, for inhibiting the formation of electrical leakage between the stem leads of an electron discharge device, is a substantially infundibular shaped member formed for umbrella-fashion-attachment to an individual lead to effect better shielding of the bead area surrounding the lead. A hollow conic section, extending below a tube-like attachment portion, has an annular basal-oriented projecting portion with a peripheral downturned portion therearound. The integral shaping of the downturned portion with the projection provides beneficial structural reinforce-



ment and rigidity to the structure and effects improved shielding characteristics.

3,728,574

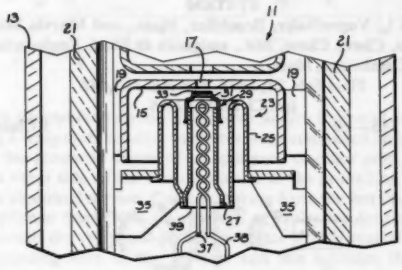
CATHODE CAP

David Benda, Geneva, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Oct. 19, 1971, Ser. No. 190,599

Int. Cl. H01j *1/20, 29/04, 29/48*

U.S. Cl. 313—337 **1 Claim**



A closure cap, having improved dimensional stability, is provided for capping a terminal-emitting cathode ray tube cathode sleeve. The closure is diversely shaped to have a mesa-like terminal portion, with the planar end surface thereof formed to provide a flat substrate area to accommodate the deposition of electron emissive material thereon. A strengthening transition portion extends from the periphery of the mesa-like portion to form an annular shoulder therearound. A peripheral skirt portion, extending downward from the shoulder, is of a length and internal diameter to facilitate encompassment and affixation to the terminal portion of the sleeve.

3,728,575

DIGITAL VECTOR GENERATOR WHICH CAUSES THE ELECTRON BEAM TO MOVE IN THE LARGEST POSSIBLE INCREMENT BY SENSING IF THE LINE IS DIVISIBLE BY 2^n

Mauritz Granberg, Minneapolis, and Hubert W. Mueller, Jr., Hamburg, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

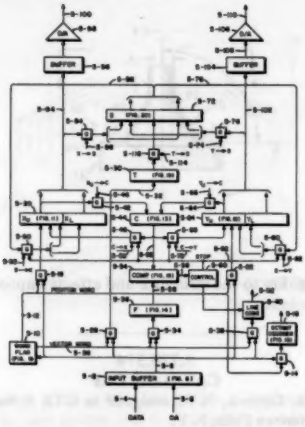
Division of Ser. No. 569,481, Aug. 1, 1966, Pat. No. 3,510,634. This application July 17, 1969, Ser. No. 871,161

Int. Cl. H01j *29/70*

U.S. Cl. 315—18 **2 Claims**

A circuit for use in a cathode ray tube vector display device for controlling the speed at which the electron beam is made

to transverse the screen. The circuit senses whether the length of the line segment yet to be formed is evenly divisible by



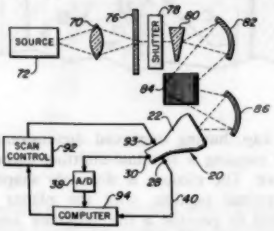
2,4,8. . . 2^n and causes the electron beam to move in the largest possible increment.

3,728,576

SELECTIVELY READ ELECTRO-OPTICAL IMAGING SYSTEM

Richard L. Vogenthaler, Brookline, Mass., and Marvin Margoshes, Chevy Chase, Md., assignors to Block Engineering, Inc., Cambridge, Mass.

Filed Feb. 22, 1971, Ser. No. 117,446
Int. Cl. H01J 31/26
U.S. Cl. 315—10 **9 Claims**



An electronic image-encoder with an SEC vidicon in which the electron beam is positioned according to a coordinate pair stored as digital signals and applied as analog signals to the deflection coils of the vidicon. This permits the beam to read selected points on the vidicon target and the beam is blanked until the desired deflection signals are applied.

In one version of the device, the deflection signals are simply voltages corresponding to the values of the digital signals. In another version, one digital signal is converted to an analog deflection voltage and a standard ramp is used as the other deflection voltage, the beam being turned on to read only after a time interval following initiation of the ramp, which interval is proportional to the other digital signal.

A special application of the encoder incorporates a crossed-dispersion optical system for projecting several stacked spectral orders into the vidicon target.

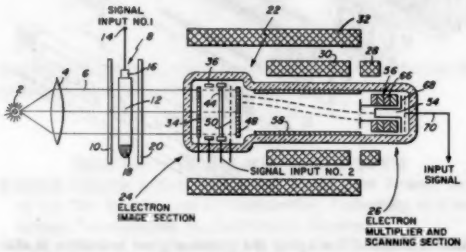
In all cases, the electron beam actuation provides an output signal corresponding to the image intensity at the point selected by the digital signal pair, and this output signal is digitized for storage, manipulation or display.

3,728,577

IMAGE CORRELATOR TUBE WITH SECONDARY TRANSMISSION OF COLLIMATED RAYS

John M. Osepchuk, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 21, 1970, Ser. No. 65,874
Int. Cl. H01J 31/48
U.S. Cl. 315—11 **2 Claims**



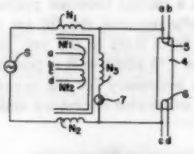
An image orthicon type device is disclosed for electrooptical integration and correlation systems. A photoemissive cathode and a dynode electrode of an electron conductive dielectric material provide for direct emission of secondary electrons from collimated light input signals to impinge on an insulated target member. The normal photoelectric emission current is multiplied by a factor inherent in direct secondary electron emission by the dynode electrode and becomes a linear function of the accelerating potential between the photocathode and dynode for processing time variable modulating signals. An axial focusing magnetic field is utilized. The dynode electrode arrangement may be constructed as a separate sealed compartment in the overall device.

3,728,578

HIGH OUTPUT OPERATING APPARATUS FOR A FLUORESCENT LAMP

Shunichi Nozawa, Hyogo; Hisashi Kuroi; Masamichi Hatada, both of Kyoto, and Shunsaku Fukuyama, Hyogo, all of Japan, assignors to Blackwell Electronics Ind. Co., Ltd., Shimogyo-ku, Kyoto, Japan

Filed April 27, 1971, Ser. No. 137,781
Claims priority, application Japan, Nov. 30, 1970, 45/105644
Int. Cl. H05b 41/14
U.S. Cl. 315—99 **9 Claims**



A high output operating circuit for a fluorescent lamp includes, in one embodiment, a magnetic circuit formed by confronting E-cores and having a pair of outer legs and a center leg. A pair of lamp current control windings are wound on the outer legs, and a cathode preheating compensation winding and a pair of cathode heating windings are wound on the center leg. The flux from the current control windings are in opposition in the center leg. The compensation winding is connected across the lamp between the cathodes by a glow starter. During preheating, the glow starter is closed, and the flux from the compensation winding superposed in the center leg provides optimum cathode preheating. When the lamp is operating, the glow starter is open, and the opposed flux in the center leg provides optimum cathode heating.

In a second embodiment, a lamp current control winding, a

pair of cathode heating windings, and a preheating compensation winding are wound on a common magnetic circuit. A pair of manually operated switches connect the windings in series with the lamp cathodes to provide optimum cathode preheating. During operation, the switches remove the compensation winding from the circuit and connect the cathode heating windings across the cathodes to provide optimum cathode heating.

3,728,579

LINE SCANNING CIRCUIT ARRANGEMENTS HAVING LINEARIZING MEANS

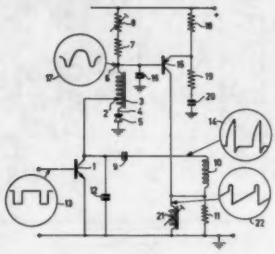
Stanislaw Rogowski, Cambridge, England, assignor to Pye Limited, London, England

Filed Nov. 4, 1971, Ser. No. 195,700

Claims priority, application Great Britain, Nov. 11, 1970, 53,643/70

Int. Cl. H01j *29/70*; H03k *4/08*

U.S. Cl. 315—27 TD **7 Claims**



A line scanning circuit having its output circuit a-c coupled to a scanning coil employs linearizing means comprising a transistor to generate a parabolic waveform that is injected into the bottom of the scanning coil while the conventional sawtooth waveform is supplied to the top of the scanning coil.

3,728,580

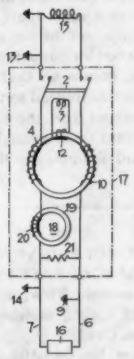
CORE-BALANCE EARTH LEAKAGE PROTECTION

Maurice R. Marot, Transvaal, Republic of South Africa, assignor to Electrical Protection Company (Proprietary) Limited, Benoni, Transvaal, Republic of South Africa

Continuation of Ser. No. 819,900, April 28, 1969, abandoned. This application April 6, 1971, Ser. No. 131,798

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 D **8 Claims**



The core balance earth leakage protection device is improved by providing in combination with it a suitable saturable core reactor whose winding is connected in series with one primary winding of the device, usually that connected in series with the neutral conductor of the circuit. The saturable core reactor is adapted to provide an impedance of substantial value for currents below and near the rated threshold sensitivity of the device but to be saturated at the usual load current values for which the device is adapted, and to therefore offer negligible impedance to the flow of load currents. The core balance earth leakage protection device is advantageously further provided in combination with a preload impedance connected between a line conductor at a point on the load side of one winding of the device and the neutral conductor at a point on the load side of another winding of the device, adapted to draw sufficient additional current through the one winding of the device to overcome the balancing current that would flow in the other winding due to an earth short circuit. The effective impedance of the tripping core of the device must be low in comparison to the impedance of the saturable core reactor for values of current in the order of the threshold sensitivity of the device.

3,728,581

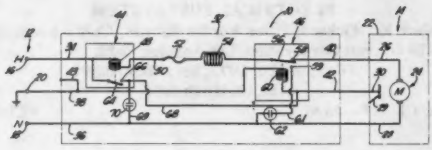
GROUND FAULT CIRCUIT INTERRUPTER

Daniel M. Adamo, 125 E. Crescent Avenue, Redlands, Calif.

Filed May 27, 1971, Ser. No. 147,516

Int. Cl. H02h *3/16*

U.S. Cl. 317—18 A **3 Claims**



A ground fault circuit interrupter and/or indicator comprising a relay switch and/or indicator lamp connected on one side to the grounded frame of an appliance or other part, and on the other side to the neutral wire or to the grounding wire of the electrical service. Current leaking from the hot line to the appliance frame due to moisture or faulty insulation passes through the relay coil and/or indicator to the neutral line or grounding wire of the service, and this actuates the relay switch to open the hot line circuit to the appliance. In one embodiment, there is an additional circuit breaker in the hot line comprising a relay switch serially connected to the hot line, which is energized by excessive current flow, as in a line-to-line short.

3,728,582

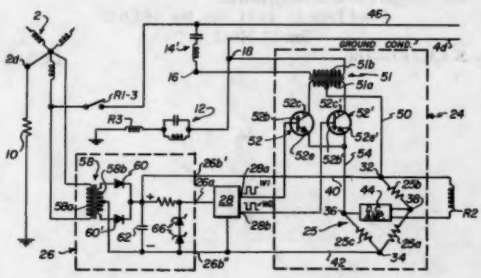
GROUND CONTINUITY MONITORING SYSTEM

Thomas I. Agnew, Irwin, Pa., assignor to Gulton Industries Inc., Metuchen, N.J.

Filed Dec. 23, 1971, Ser. No. 211,449

Int. Cl. H02h *3/16*

U.S. Cl. 317—18 C **14 Claims**



In a system which delivers electrical power to remotely located electrical equipment, such as mining equipment,

through power conductors in a cable extending from a main source of power to the equipment, the cable including at least two power conductors connected to the electrical input terminals of the equipment and a ground conductor connected to the frame of the equipment, there is added a ground conductor monitoring circuit including power circuit isolating means connected to one of the power conductors of the cable and the ground conductor thereof to provide across a pair of connecting terminals a series circuit including the cable ground conductor isolated from the main power circuit at a given frequency substantially different from the main power source frequency. These connecting terminals are preferably connected across the secondary winding of a transformer having a center tapped primary winding driven by push-pull connected transistors or the like fed by the oppositely phased outputs of a signal generator circuit at said given frequency. The push-pull transistor circuit includes a load resistance on one side of the load terminals thereof constituting one arm of a D.C. bridge circuit, and the load terminals and the primary winding of the transformer constituting the adjacent arm of the D.C. bridge circuit. Control means at the output of the bridge circuit is responsive to the output of the bridge circuit indicating that the impedance reflected into the primary winding exceeds a given value by disconnecting the main power source from the cable power conductors.

3,728,583

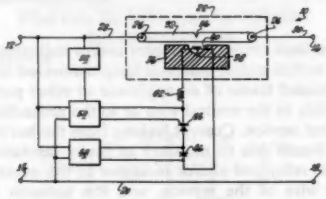
ELECTRICAL FUSE SYSTEM

Arthur K. Wickson, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed July 10, 1972, Ser. No. 270,392

Int. Cl. H02h *3/08*

U.S. Cl. 317—33 SC **9 Claims**



An electrical fuse has a link with a notch or reduced section portion, adjacent which is a source of mechanical energy which is arranged to be energized from the charge on a capacitor by the closure of a switch, preferably a thyristor which is gated by a circuit means sensing the current flowing in the link.

3,728,584

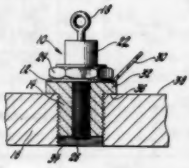
SEMICONDUCTOR DEVICE MOUNTING ADAPTER

Robert J. Kuhlow, Brookfield, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed June 21, 1971, Ser. No. 155,058

Int. Cl. H01l *1/12*

U.S. Cl. 317—100 **1 Claim**



An adapter assembly is described for electrically insulating a stud mount semiconductor device from its supporting heat sink while maintaining good thermal communication between them. An externally and internally threaded boron nitride tubular adapter is threaded into a heat sink recess. The semiconductor device stud is threaded into the adapter.

3,728,585

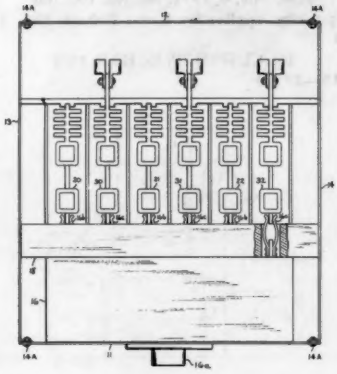
ELECTRIC SWITCHBOARD ASSEMBLY WITH BUS BAR HEAT PIPE MEANS

William F. Olashaw, Plainville, Conn., assignor to General Electric Company

Filed June 12, 1972, Ser. No. 261,596

Int. Cl. H02b *1/20;* **H01b** *7/34*

U.S. Cl. 317—100 **7 Claims**



An electric switchboard assembly, including a main enclosure and a number of vertically extending main power supply busbars and electrical control devices having line terminals connected to the busbars. Heat dissipating means is provided operating on the "heat pipe" principle to dissipate heat generated in the electrical control devices and/or in the connections of such devices. The heat dissipating means operates by transporting the heat to a different location in the switchboard from that in which it is created and dissipating it to suitable heat receiving means such as a circulating heat receiving medium such as air. The vertically extending power supply busbars each comprise a pair of spaced tubular busbar members. The electrical control devices are connected to a first one of the pair of busbars, and the other one of the pair of busbars is provided with heat dissipating means, such as fins. The pair of busbars are spaced apart and are interconnected by tubular members adjacent the top and bottom ends to form a closed loop. This closed loop is evacuated and provided with a liquid and wicking means so that it acts as a heat pipe whereby heat which is transmitted to the first one of the members of the pair of busbars from the electrical control devices or by the flow of current therethrough is carried to the other member of the pair and dissipated to the circulating air around the fins.

3,728,586

AC POWER MODULE HAVING AN INTEGRAL MECHANICAL SAFETY DEVICE

Alan E. Inhelder, Mountain View, and Richard L. Hoogner, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

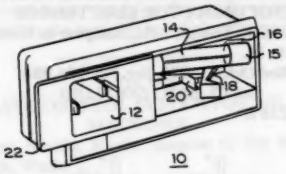
Continuation of Ser. No. 046,406, June 15, 1970. This application Jan. 7, 1972, Ser. No. 216,310

Int. Cl. H02b *1/18*

U.S. Cl. 317—114 **5 Claims**

An A.C. power receptacle is contained in one compartment of a module and a fuse holder, fuse ejector and line voltage

switch are contained in the other compartment. A sliding door allows access to only one compartment at a time, and a safety



interlock prevents the line voltage switch from being changed unless the fuse is ejected.

3,728,587

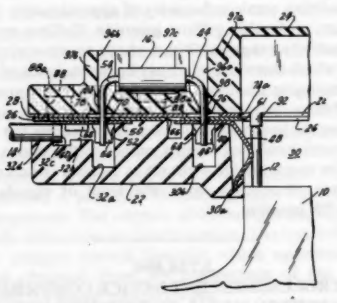
KINESCOPE TUBE SOCKET WITH COMPONENT RECEIVING MEANS

Seymour Offerman, New York, N.Y., assignor to Industrial Electronic Hardware Corp., New York, N.Y.

Filed Nov. 4, 1971, Ser. No. 195,754

Int. Cl. H02b *1/04*

U.S. Cl. 317—118 **34 Claims**



A socket for a tube having pins comprises a receiving means for said pins and pin contacts adapted to engage the pins. Wire contacts are spaced from the pin contacts and are adapted to be connected to lead wires. Each of the contacts has a means for receiving a component lead so that components can be inserted between the pin and wire contacts. Therefore, each of the components will be in series between the lead wires and the electrodes of the tube.

3,728,588

METHOD OF BEHAVIOR THERAPY

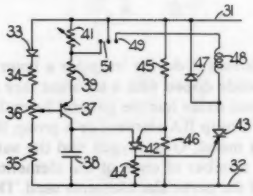
Christopher Robin Jones, 21 Newport Drive, Alcester, England

Filed July 22, 1971, Ser. No. 165,182

Claims priority, application Great Britain, July 31, 1970, 37,094/70

Int. Cl. H01h *47/18*

U.S. Cl. 317—141 S **4 Claims**



A method of behavior therapy wherein a subsequent trial is automatically initiated after a variable time period determined by the duration of the previous trial.

3,728,589

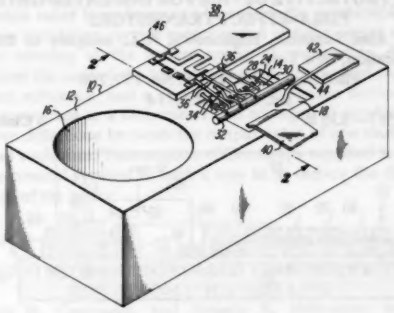
SEMICONDUCTOR ASSEMBLY

Martin Caulton, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed April 16, 1971, Ser. No. 134,769

Int. Cl. H011 *1/02, 1/14*

U.S. Cl. 317—234 R **4 Claims**



A semiconductor assembly for high frequency, high power operation includes a ground plane member of a block of an electrically and thermally conductive material having a cavity in the top surface thereof. A mounting block of an electrically insulating and thermally conductive material is mounted on the ground plane member in the cavity, and a transistor element is mounted on the mounting block. The transistor element has a collector electrode on one surface which is mechanically and electrically connected to a metal film on the mounting block, and emitter and base electrodes on its other surface which are substantially coplanar with top surface of the ground plane member. A ground bar extends across the cavity adjacent the transistor element and is mechanically and electrically connected to the top surface of the ground plane member. The base electrode of the transistor element is electrically connected to the ground plane member by wires extending from the base electrode to the top surface of the ground plane member and the ground bar. Input and output tuning circuits may be mounted on the top surface of the ground plane member and electrically connected to the base electrode and collector electrode respectively.

3,728,590

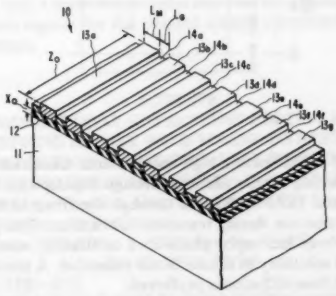
CHARGE COUPLED DEVICES WITH CONTINUOUS RESISTOR ELECTRODE

Choong-Ki Kim, San Jose, and Edward H. Snow, Los Altos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed April 21, 1971, Ser. No. 136,087

Int. Cl. H011 *11/14*

U.S. Cl. 317—235 R **7 Claims**



A charge coupled device comprises a semiconductor substrate containing on one surface an insulating layer together with a plurality of electrodes spaced from each other by re-

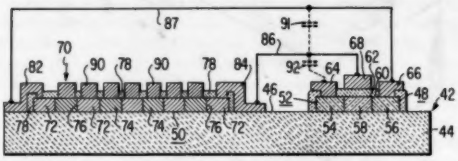
sistive material. This resistive material prevents the formati of potential barriers between the electrodes and increases t speed of transfer of charge from beneath one electrode t beneath an adjacent electrode.

3,728,591

GATE PROTECTIVE DEVICE FOR INSULATED GATE FIELD-EFFECT TRANSISTORS

Richard Alan Sunshine, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,790
Int. Cl. H01 *1/14*
U.S. Cl. 317—235 R **6 Claims**



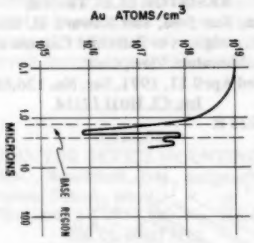
The protective device comprises a thin film of semiconductor material on an insulating substrate, contiguous regions of the film being of opposite conductivity type and providing a plurality of serially connected diodes in back-to-back relationship. Disposed on the surface of various different ones of the regions are layers of metal for reducing the electrical resistance of the device. The device is connected between the gate electrode of the transistor to be protected and either the source or drain electrode thereof.

3,728,592

SEMICONDUCTOR STRUCTURE HAVING REDUCED CARRIER LIFETIME

Madhukar Laxman Joshi, Essex Junction, Vt.; Burton Joseph Masters, Poughkeepsie, N.Y.; Osvaldo Raul Viva, Williston, Vt., and Tsu-Hsing Yeh, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 823,255, May 9, 1969, Pat. No. 3,625,781.
This application Sept. 14, 1971, Ser. No. 180,488
Int. Cl. H01 *7/44, 9/12, 19/00*
U.S. Cl. 317—235 R **8 Claims**



A method of fabricating high-speed planar transistor structures by reducing carrier lifetime through doping with carrier lifetime killers. Gold is diffused through the front surface of the silicon structure during transistor fabrication. The gold is introduced from the vapor phase in a controlled manner so that its solid solubility in silicon is not exceeded. A simultaneous gold and base diffusion is preferred.

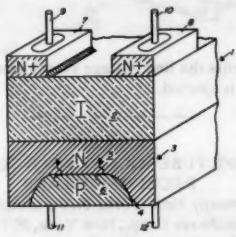
Such a simultaneous diffusion produces a novel planar transistor structure having a gold distribution curve with an unexpected increased concentration peak in the region proximate to the base-collector junction.

3,728,593

ELECTRO OPTICAL DEVICE COMPRISING A UNITARY PHOTOEMITTING JUNCTION AND A PHOTOSENSITIVE BODY PORTION HAVING HIGHLY DOPED SEMICONDUCTOR ELECTRODES

Michael G. Coleman, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 6, 1971, Ser. No. 186,884
Int. Cl. H01 *1/00, 15/00*
U.S. Cl. 317—235 R **5 Claims**



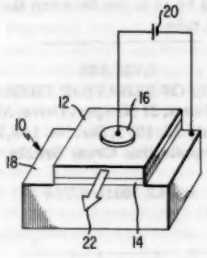
There is disclosed an electro optical device comprising a single body of semi insulating semiconductor material having a semi insulating semiconductivity of approximately 10^8 ohm-centimeters, preferably gallium arsenide. Gallium arsenide in this conductivity range exhibits a photo conductivity characteristic in which there is a relatively linear variance of resistivity with impinging photons. A PN junction is formed in one portion of the substrate and, responsive to electric signals applied across the junction, emits photons affecting the resistivity of the semi insulating layer. Contact to the photo resistive layer can be connected in a circuit as either a switch or a variable resistor, depending upon the level of signals applied across the PN junction.

3,728,594

ELECTROLUMINESCENT DEVICE COMPRISING A TRANSITION METAL OXIDE DOPED WITH A TRIVALENT RARE EARTH ELEMENT

Woongsoon Michael Yim, and Perry Niel Yocom, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,708
Int. Cl. H05b *33/00*
U.S. Cl. 317—235 R **6 Claims**



An electroluminescent device includes a layer including a transition metal oxide doped with a trivalent rare earth metal. The transition metal oxide has the general formula, $M_x{}^{I}(M^{II}O_y)_z$ where M^{I} is a Group IIA element or a group IIIB element, M^{II} is a transition metal, O is oxygen and the subscripts x, y and z denote the number of each of the elements depending on the valences of the particular elements used. The layer may be in the form of a single crystalline body of the doped transition metal oxide or particles of the transition metal oxide in a dielectric medium. A pair of spaced contacts are provided on the layer. For the single crystalline body one of the contacts is a blocking contact and the other is an ohmic contact. For the

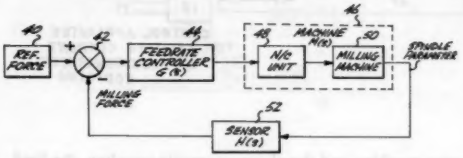
layer which includes the particles in a dielectric medium, both contacts are blocking contacts. Light is emitted from the layer when a current is applied through the layer between the contacts; DC current being used for the single crystalline body and AC current for the particles in a dielectric medium.

3,728,595

FEEDRATE CONTROL SYSTEM FOR MILLING MACHINES

Lyle C. Adams, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1970, Ser. No. 14,918
Int. Cl. G05b *19/24*
U.S. Cl. 318—39 **9 Claims**



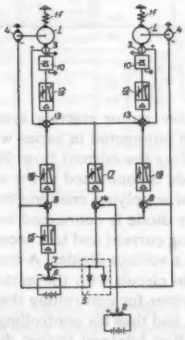
A system for automatically controlling the feedrate of a milling machine includes a sensor which measures the actual milling force exerted on the cutting element thereof during the milling process. If the actual milling force exceeds a pre-set reference force, a controller supplies a control signal to the feedrate control circuits within the milling machine to appropriately modify the feedrate. A sensor housing for cutter drawbar machines includes a spindle adapter which is interposed between the spindle and cutting element and which has disposed thereon a plurality of strain gauges disposed in a bridge arrangement. The outputs of the bridges correspond to either spindle deflection or spindle torque. The controller may include an integral control function which operates on an error signal obtained from the comparison of the pre-set reference and the actual milling forces.

3,728,596

PLURAL MOTOR SLIP-CONTROLLED DRIVING MEANS FOR TRACTION PURPOSES

Bo Hermansson, and Jorgen Gustafsson, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed March 8, 1971, Ser. No. 121,977
Claims priority, application Sweden, March 6, 1970, 3001/70
Int. Cl. H02p *5/50*
U.S. Cl. 318—52 **5 Claims**



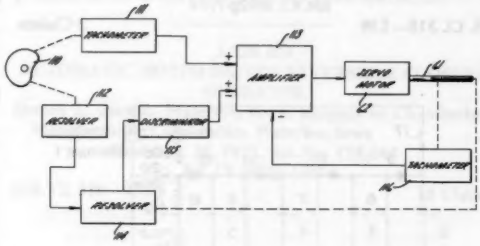
A slip controlled driving means for traction purposes includes a plurality of direct current motors connected to various wheel shafts. They are provided with control rectifiers forming valve control systems to control the motor current. The rectifiers respond to a first reference value supplied to the system by a first reference value transducer, a current transducer for the rotor current and a tachometer for each motor. A minimum selector is provided to compare the output values of all the tachometers and to pick out the lowest one. A reference value transducer can be set for the permissible difference between a certain motor speed and the speed of the motor rotating at the lowest speed. A summation device produces the sum of the lowest tachometer value and this difference reference, and a plurality of comparison devices are each connected to a tachometer and arranged to produce the positive difference between the output value of one tachometer and such sum. This positive difference is supplied to each of the control systems in such a way as to reduce the driving current of the motor.

3,728,597

SERVO MOTOR CONTROLLED TRANSFER SYSTEM FOR AUTOMATIC PRESS LINE

Joseph R. Cummens, and Francis E. Heiberger, both of Elmhurst, Ill., assignors to Danly Machine Corporation, Chicago, Ill.

Filed July 8, 1971, Ser. No. 160,799
Int. Cl. H02p *5/52*
U.S. Cl. 318—85 **5 Claims**



A transfer system for an automatic press line which includes a gripper for transferring workpieces between presses. The gripper is supported on the ends of a pair of transfer arms projecting from a corresponding pair of pantographs. The pantographs are manipulated by a pair of ball screw assemblies operated by a corresponding pair of servo motors. The servo motors are electrically connected to the press drive for synchronizing movement of the transfer assembly with the press line. A pair of cams connected to the press drive are associated with a tachometer and a resolver for generating electrical input signals for the control system associated with the servo motors.

3,728,598

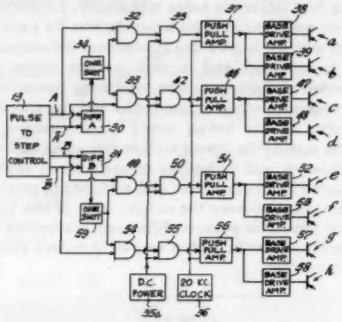
BI-DIRECTIONAL ENERGIZING CIRCUIT FOR A STEPPING MOTOR WITH MEANS TO PREVENT CONDUCTION IN ONE COIL UNIT PREVIOUSLY ENERGIZED COIL CONDUCTION IS EXTINGUISHED

Joe Cyril May, Cheshire, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Nov. 2, 1970, Ser. No. 86,054
Int. Cl. H02k *29/00*
U.S. Cl. 318—696 **5 Claims**

A stepping motor having its stator windings connected into two phases is advanced one step by reversing the direction of current flow in one of the phases. Each phase is connected to D.C. source by a pair of paths with each path directing current in a different direction through the phase. The paths are

ternately shiftable from conducting to non-conducting with the shift of a path to being conducting being delayed until current flow from the path shifted to non-conducting is essentially zero to prevent short circuiting between the paths.

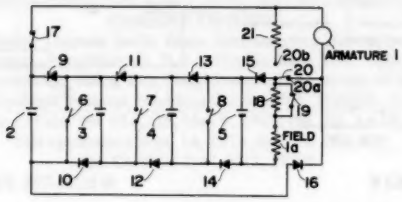


3,728,599

CONTROL SYSTEM FOR AN ELECTRIC AUTOMOTIVE VEHICLE

Hirosi Minami, Kawasaki-shi, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima-ken and Fuji Electric Co., Ltd., Kawasaki-shi, Kanagawa-ken, Japan

Filed July 30, 1971, Ser. No. 167,569
Int. Cl. H02p 7/14
U.S. Cl. 318—139 **3 Claims**



A control system for an electric automotive vehicle driven by a battery operated D.C. series motor, comprising a motor control circuit for controlling stepwisely D.C. voltage applied to a motor to regulate the speed of the motor and control means for charging batteries during regenerative braking operation of the vehicle. The motor control circuit is constituted of four batteries, six unidirectional devices and three switching means.

3,728,600

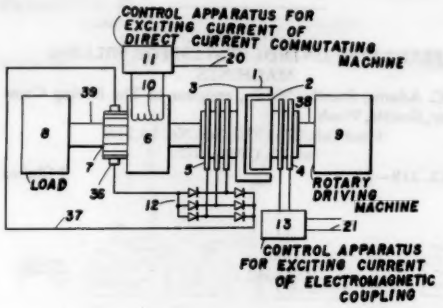
ARRANGEMENT FOR TRANSMITTING MECHANICAL POWER FROM A DRIVING MACHINE TO A LOAD

Fukuo Shibata, 3-22, Tokiwa-cho, Nishinomiya, Japan

Filed June 16, 1971, Ser. No. 153,708
Int. Cl. H02k 1/26
U.S. Cl. 318—197 **7 Claims**

When an electromagnetic coupling having two rotors is connected mechanically with a direct current commutating machine, in such a way that a rotor is used in common as one of the two rotors of the electromagnetic coupling and as a rotor of the direct current commutating machine, the electric machine arrangement can be a power transmitting device which is of high efficiency and has a simple construction.

If the rotor shaft of the direct current commutating machine is connected mechanically with a load, and the other rotor of the electromagnetic coupling is driven by a driving machine such as a prime mover, further rectifiers are electrically connected between armature windings of the direct current commutating machine and the electromagnetic coupling, the load can be controlled over a wide speed range.

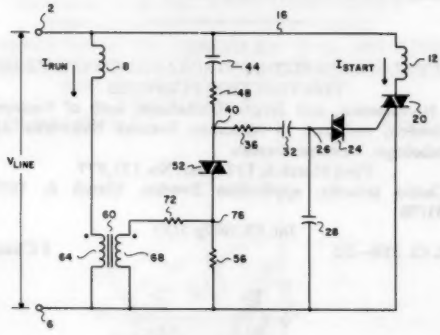

CONTROL APPARATUS FOR EXCITING CURRENT OF DIRECT CURRENT COMMUTATING MACHINE
LOAD
ROTARY DRIVING MACHINE
CONTROL APPARATUS FOR EXCITING CURRENT OF ELECTROMAGNETIC COUPLING

3,728,601

TRIGGER DIODE CONTROLLED MOTOR STARTING SYSTEM

David C. Fricker, Hurst, and Thomas F. Whittaker, Forth Worth, both of Tex., assignors to ECC Corporation, Euless, Tex.

Filed Sept. 3, 1971, Ser. No. 177,576
Int. Cl. H02p 1/44
U.S. Cl. 318—221 E **9 Claims**



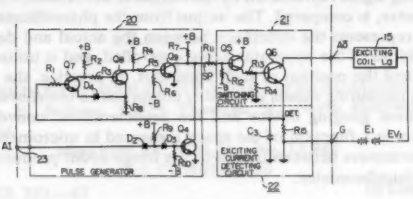
A speed responsive motor starting system includes a bilateral triode switch connected in series with the motor start winding for controlling the current flow therethrough. A first bilateral trigger diode is connected to the control electrode of the triode switch for supplying enabling current thereto. The first bilateral trigger diode is connected to a capacitor which provides the enabling current and to a second bilateral trigger diode connected to a voltage divider. A current-sensing transformer is coupled in circuit with the motor run winding and with the voltage divider for controlling the voltage applied to the voltage divider, and thus for controlling the voltage necessary to trigger the first bilateral trigger diode in accordance with the motor speed. Phase compensating capacitors are provided to advance the phase angle of the voltage which triggers the first bilateral trigger diode.

3,728,602

SYSTEM OF DRIVING A PULSE MOTOR

Mitsuo Manabe, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki-shi, Kanagawa-ken, Japan

Filed March 8, 1971, Ser. No. 121,662
Claims priority, application Japan, March 23, 1970, 45/24201
Int. Cl. H02p 7/00
U.S. Cl. 318—434 6 Claims



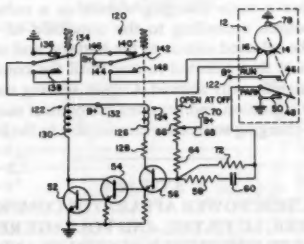
A high DC voltage is supplied to the exciting coil of a pulse motor and the current flowing in the exciting coil is detected and it is instantly cutoff when the above-mentioned current reaches a predetermined value. Accordingly, the pulse motor can be advantageously provided with a small power loss in a switching circuit as well as in the exciting circuit, because the value of a series resistor of the exciting coil can be decreased to a minimum or even to zero. Further, a quick response frequency characteristic and a simple and economical circuit capable of automatically adjusting the exciting current at all time can be expected, because the high voltage is impressed upon the exciting coil.

3,728,603

WINDSHIELD WIPER CONTROL

Robert W. Kearns, 20524 Rutherford Ave., Detroit, Mich.

Division of Ser. No. 815,060, April 10, 1969, Pat. No. 3,581,178. This application Oct. 27, 1970, Ser. No. 84,451
Int. Cl. B60s 1/08
U.S. Cl. 318—443 1 Claim



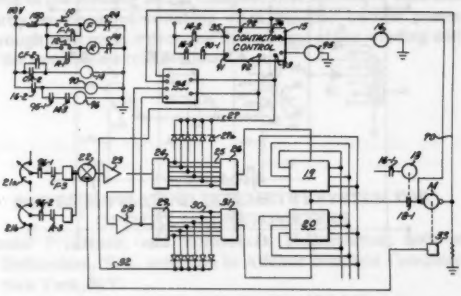
An electric control device controlling a wiper motor to operate windshield wiper blades intermittently with a dwell period between successive wiping cycles. The wiper motor current is carried by relay contacts and a solid state timing circuit controls the energization of the relay coil.

3,728,604

MOTOR CONTROL SYSTEM

James W. Grygera, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed July 26, 1971, Ser. No. 165,469
Int. Cl. H02p 5/04
U.S. Cl. 318—459 18 Claims



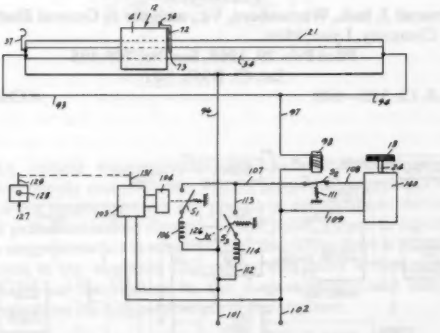
Motor control system in which the electromotive force generated by the motor and motor armature current is sensed on starting and stopping to inhibit operation of the motor contactor for making and breaking the armature circuit in the presence of the electromotive force or armature current.

3,728,605

AUTOMATIC MOTOR DRIVEN REVERSIBLE CLOSURE OPERATOR

Dennis L. Purtilo, Waterloo, Iowa, assignor to Chamberlain Manufacturing Corporation, Waterloo, Iowa

Filed Aug. 26, 1971, Ser. No. 175,046
Int. Cl. H02p 1/00
U.S. Cl. 318—475 16 Claims



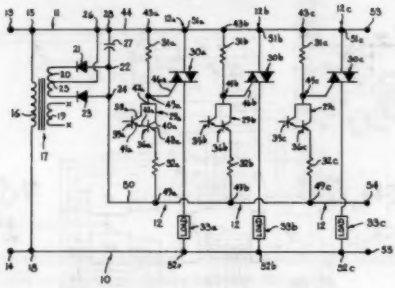
An overhead control for raising and lowering garage doors and other cyclically operated devices which utilizes a unidirectional electric motor which drives an endless chain in only one direction. A follower rides on a rail and is coupled to the endless chain by a gear which engages the chain on one side so as to move the follower in a first direction. When the follower reaches the end of the rail, the gear of the follower rotates 180° so as to engage the opposite side of the chain and thus move the follower in the opposite direction. The tension may be adjusted so that a door will stop or reverse when it meets resistance sufficiently firm to shift the gear of the follower.

3,728,606

SOLID STATE HOSPITAL BED POWER CONTROL UNIT

Cyril Owen Finnegan, Normal, and Art Lee, El Paso, both of Ill., assignors to General Electric Company, New York, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,787
Int. Cl. H02p 7/74
U.S. Cl. 318—480 9 Claims



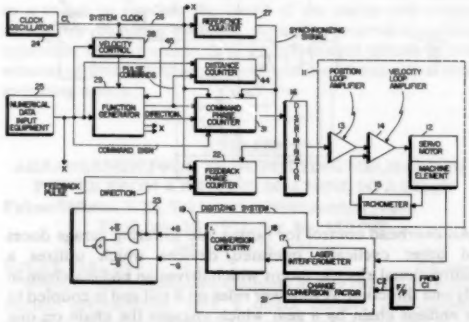
An electrical power control unit, preferably for use with hospital bed control handsets, including control circuitry comprising a first portion wherein the primary winding of a control power transformer is connected across AC power, the secondary winding of the transformer is connected to the handset, and the tertiary winding of the transformer is connected in circuit to form a full wave center tapped rectifier, said control circuitry further including one or more other circuit portions each comprising a load, a photo transistor amplifier, a Triac, and a pair of resistors connected in circuit wherein the photo transistor amplifier is activated when light falls upon its sensitive surface and wherein upon activation of the photo transistor the gate of the associated Triac changes polarity thus causing the Triac gate to conduct power to the associated load.

3,728,607

PHASE ANALOG NUMERICAL CONTROL SYSTEM EMPLOYING A LASER DIGITIZED POSITION FEEDBACK

Conrad J. Isak, Waynesboro, Va., assignor to General Electric Company, Lynn, Mass.

Filed Feb. 29, 1968, Ser. No. 709,405
Int. Cl. G05b 1/01
U.S. Cl. 318—608 4 Claims



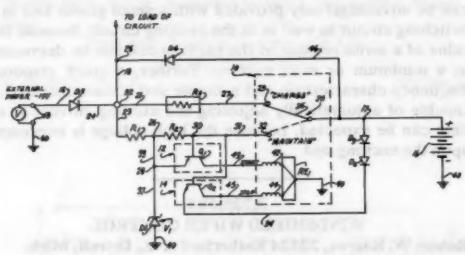
A digitally operable phase analog numerical control is described which comprises position measuring means for producing a train of pulses wherein the individual pulses represent increments of movement of apparatus being controlled and hence is representative of the position of the apparatus in standard measurement units. Variable rate feedback counter means are coupled to the output from the conversion circuit for producing a variably phase shifted, phase analog actual position output signal in accordance with the digitized position signal. Phase discriminator means are also provided having one input coupled to the output from the feedback phase counter and a digitally operable command phase counter means is provided for producing an output phase analog command signal of substantially the same base frequency and waveshape as the feedback phase counter. The output of the command phase counter is supplied to a second input of the phase discriminator and serves as a command phase analog signal against which the actual position phase analog signal represented by the output of the feedback phase counter, is compared. The output from the phase discriminator represents the difference between the actual and desired positions of the apparatus being controlled, and is utilized to control the position of such apparatus. In practice, the position measuring means preferably comprises an interferometer position gauging device and the predetermined conversion factor is a function of the space measured in microinches or micrometers between fringes of the fringe count produced by the interferometer.

3,728,608

BATTERY CHARGING CIRCUIT WITH TWO CHARGING SOURCES OF DIFFERENT VOLTAGE

Rudor M. Teich, 6040 Boulevard E., West New York, N.J.

Filed Feb. 9, 1970, Ser. No. 9,886
Int. Cl. H02j 7/04
U.S. Cl. 320—23 14 Claims



A battery charging circuit is provided which automatically charges a battery, maintains a constant voltage across the battery after it is charged and during the period of its non-use, and again charges the battery after a sufficient current drain occurs such as when a load is placed across the battery terminals. The charging circuit includes control means which selects either a main charging source or a reduced voltage charging source according to the condition of the battery, connects the selected source to the battery, and continues the connection of that selected source until the condition of the battery is significantly altered. Circuit sensing means detects the battery condition and actuates the control means to select the proper charging source for connection to the battery.

3,728,609

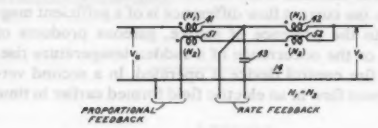
ELECTRIC POWER APPARATUS COMPRISING CONVERTER, LC FILTER, AND VOLTAGE REGULATOR ARRANGED FOR HIGHLY ACCURATE AND STABLE RESPONSE

Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company

Filed July 7, 1972, Ser. No. 269,787
Int. Cl. H02m 1/14
U.S. Cl. 321—10 5 Claims

In electric power apparatus including a voltage-regulated converter and an LC filter supplying a load circuit with relatively smooth unipolarity voltage of desired magnitude, accu-

racy is promoted by using a novel proportional feedback arrangement which takes into account the IR drop across the series inductance of the filter while avoiding its dynamic transfer characteristic.

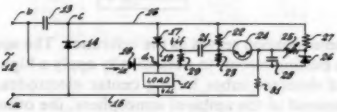


3,728,610

CONSTANT POWER REGULATOR FROM AC SOURCE

Henry N. Switsen, 11319 Vanowen St., North Hollywood, Calif.

Filed Sept. 21, 1970, Ser. No. 73,942
Int. Cl. H02m 7/20
U.S. Cl. 321—47 10 Claims



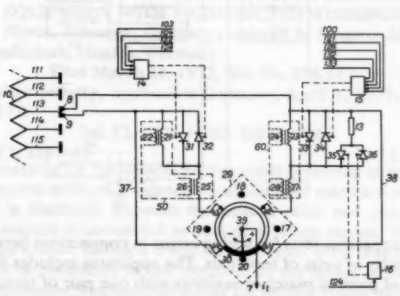
A circuit for supplying a consant power to a load from an AC source that may vary in voltage, including a diode connecting the AC source to the load to directly supply power during part of the positive half cycle, and a silicon controlled rectifier (SCR) that supplies power from a capacitor to the load during another part of each cycle. The capacitor is charged to a higher voltage than the AC source so that when it is connected to the load sometime during the positive half cycle it stops the direct flow of power to the load through the diode and the capacitor then supplies a fixed power. A circuit that senses the AC voltage will fire the SCR later in the positive half cycle when the AC source voltage rises, so that more power can flow to the load directly through the diode prior to connection of the capacitor.

3,728,611

TAP CHANGER

Sten Elvin, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 23, 1971, Ser. No. 211,329
Claims priority, application Sweden, Feb. 5, 1971, 1416/71
Int. Cl. G05f 1/20
U.S. Cl. 323—43.5 S 1 Claim



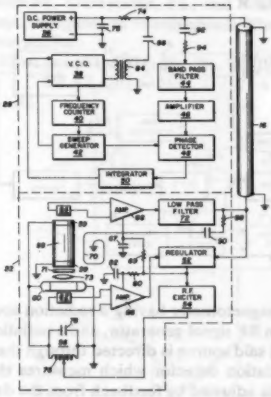
A tap changer for switching the load current of a transformer from a first winding output to a second winding output includes two pairs of anti-parallel connected semi-conductor rectifiers with a control device for each pair. A switch arrangement is provided for connecting each of the pairs between any of the outputs and a load current connection. The device includes a control arrangement for controlling and performing the switch between the outputs, which includes a device for transmitting the load current from the rectifier pair connected to one winding output to the pair connected to an adjacent winding output. This transfer is carried out partly by natural commutation except when there is a decrease in the turns of the winding and at the same time a resistive load and partly by means of switching when the load current passes through zero upon a decrease in the turns of the winding and at the same time a resistive load.

3,728,612

POWER SUPPLY AND TELEMETRY SYSTEM FOR OPTICAL MAGNETOMETERS

Daniel P. Hearn, and William D. Hetherington, both of Richardson, Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,599
Int. Cl. G01r 33/08
U.S. Cl. 324—.5 R 6 Claims



An optical magnetometer, e.g. helium magnetometer, power supply and telemetry system for aerial surveying. One or more magnetometers are placed in aerodynamic devices and pulled behind an airplane by tow cable. Power to operate the magnetometers is supplied over the cables from a primary source in the airplane. The cables also carry a depumping signal from the airplane to the magnetometers and output signals from the magnetometers to the airplane.

3,728,613

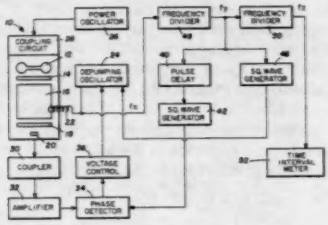
SYNCHRONIZED PERIOD MEASURING SYSTEM

Daniel P. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Feb. 2, 1971, Ser. No. 111,952
Int. Cl. G01r 33/08
U.S. Cl. 324—.5 R 4 Claims

An improvement in optical magnetometers whereby the accuracy of the output signal is increased. The depumping

frequency is determined by measuring the time interval for a predetermined number of cycles to occur. Error due to sweeping the depumping frequency is prevented by making the sweep frequency a sub-multiple of the depumping frequency.

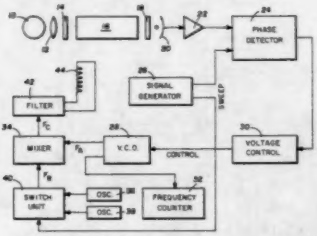


3,728,614

OPTICAL MAGNETOMETER USING A DEPUMPING SIGNAL FORMED BY FREQUENCY MODULATING THE OUTPUT OF A VARIABLE FREQUENCY OSCILLATOR WITH TWO ALTERNATING FIXED FREQUENCY OSCILLATORS

Daniel P. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,791
Int. Cl. G01r *33/08*
U.S. Cl. 324—0.5 R **13 Claims**



An optical magnetometer having a radiation source, an absorption cell, an RF signal generator, and a radiation detector. Radiation from said source is directed through the absorption cell to the radiation detector which measures the intensity. The generator is adjusted by feedback from the detector until the radiation absorbed by the cell is maximized. The RF signal generator comprises a voltage controlled oscillator having one output frequency modulated for depumping the cell and another output unmodulated for measuring the depumping frequency. The RF signal applied to the cell when maximum absorption is realized is a measure of the strength of the magnetic field in which the cell is positioned.

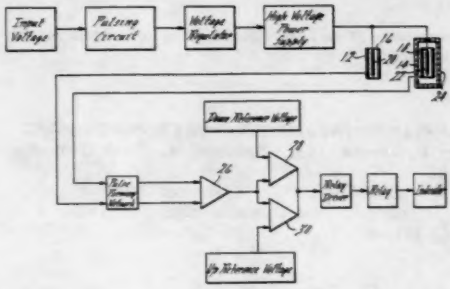
3,728,615

SMOKE, GAS, OR RAPID TEMPERATURE INCREASE DETECTOR UTILIZING A PERIODIC ELECTRIC FIELD TO CREATE A SELF-SUSTAINED AVALANCHE CURRENT

Warren R. Hill, Dearborn; I. Macit Gurol, Farmington, and Sharad M. Dave', Detroit, all of Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Oct. 29, 1069, Ser. No. 872,210
Int. Cl. G01n *27/62*; G08b *21/00*
U.S. Cl. 324—33 **10 Claims**

A method and apparatus for detecting smoke, gaseous products of combustion such as CO, CO_2, and a rapid temperature rise, the method including the steps of periodically forming, in a location exposed to the ambient atmosphere to bet tested, an electric field of sufficient intensity and of the proper configuration to produce a self-sustained Townsend avalanche, and comparing the resultant current flow with that produced in a similar such electric field created at the same time in an area shielded from the ambient atmosphere to be tested. When the current flow difference is of a sufficient magnitude due to the presence of smoke, gaseous products of combustion, or the occurrence of a sudden temperature rise, an alarm or fire control device is operated. In a second version, the current flow in an electric field formed earlier in time in the same location serves as the reference. The apparatus includes a pulsing circuit to periodically apply a high voltage to a pair of detector tubes having center electrodes, one tube being exposed to the ambient atmosphere, the other shielded. In the second version, a pulsing circuit periodically applies a voltage to a single detector tube and a holding and comparison circuit is provided to compare successive pairs of voltage pulses created by current flows caused by the periodic application of high voltages to the tube.

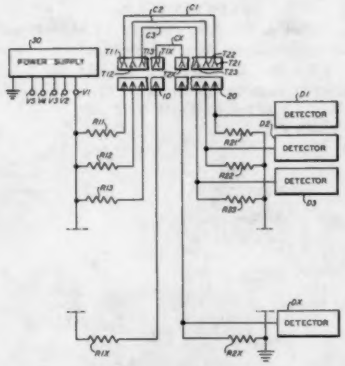


3,728,616

CONTINUITY TESTING APPARATUS UTILIZING A PLURALITY OF PAIRED RESISTORS

Howard L. Cheek, and Howard V. May, both of Winston-Salem, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 2, 1971, Ser. No. 111,960
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **6 Claims**



An apparatus tests for wiring errors in connections between a plurality of pairs of terminals. The apparatus includes a plurality of pairs of matched resistors with one pair of terminals connected between each respective pair of resistors across a voltage source. The voltage across one of each pair of resistors is sensed to determine a voltage above or below a predetermined range of voltages to indicate a defectively wired circuit.

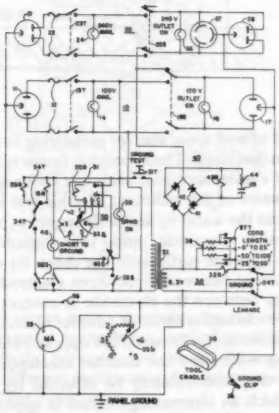
Each pair of resistors has matched resistors with values differing sufficiently from every other pair of resistors to operate the voltage sensing facilities in the event there are crossed or erroneous connections.

3,728,617

ELECTRICAL TOOL CIRCUIT CHECKER

William F. Potter, Mystic, Conn., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed Aug. 25, 1971, Ser. No. 174,649
Int. Cl. G01r *31/02, 15/12*
U.S. Cl. 324—51 **5 Claims**



An electrical tool circuit checker is provided which tests the connection of the tool case to ground, checks for a short circuit to ground, and checks the operation of the tool while power is applied to determine the running AC circuit leakage to ground. Circuits are also provided to require the tester in each case to test for ground connection first before conducting other tests.

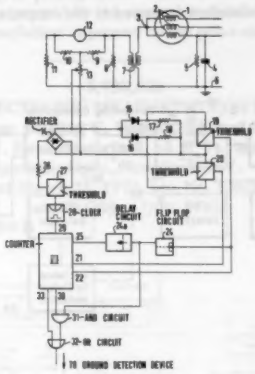
3,728,618

GROUND PROTECTION APPARATUS FOR ELECTRICAL EQUIPMENT WITH Y-CONNECTED WINDINGS

Karl Nimes, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed March 28, 1972, Ser. No. 238,847
Claims priority, application Germany, April 1, 1971, P 21 15 807.6
Int. Cl. G01r *31/02*; H02h *7/06*
U.S. Cl. 324—51 **7 Claims**

Apparatus for the detection of grounds occurring at or near the neutral point of Y-connected windings of electrical equipment is disclosed. Between the neutral point and ground a load resistor is connected as part of a bridge circuit. A bias voltage source having a frequency different from that of the system is connected to one diagonal of the bridge circuit. A potentiometer is connected across the second bridge diagonal and its voltage is evaluated by a time measuring device to determine the spacing between the zero voltage crossings of the potentiometer. The time measuring device transmits a signal indicating a ground if the time intervals between two successive zero crossings of the voltage in the potentiometer differ from each other by a predetermined amount or if a



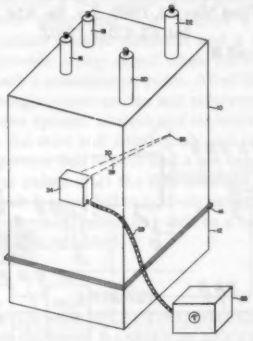
predetermined time interval between successive zero crossings is exceeded.

3,728,619

ACOUSTICAL CORONA LOCATOR HAVING ROTATABLE AND PIVOTABLE TRANSDUCERS

Ronald T. Harrold, Murrysville, Pa., and William J. Carter, Muncie, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 21, 1971, Ser. No. 155,096
Int. Cl. G01r *31/08, 31/12*
U.S. Cl. 324—52 **4 Claims**



Acoustical corona locating apparatus for use in determining the position of a corona discharge within the casing of a power transformer. Transducer apparatus, which contains at least two transducers, is attached to the wall of the transformer casing at a position where the corona produced ultrasonic wave may be detected. The transducers are rotated and pivoted to determine the direction and distance from the transducers to the corona source.

3,728,620

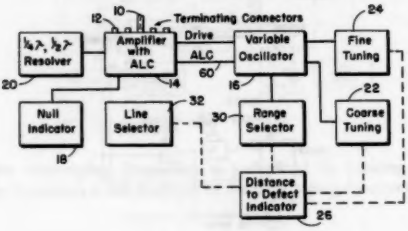
TRANSMISSION LINE FAULT INDICATOR AND LOCATOR UTILIZING VARIABLE FREQUENCY SOURCE COUPLED TO ONE END OF LINE

John L. Heins, 82 Harbor Lane, Massapequa Park, N.Y.

Continuation-in-part of Ser. No. 878,779, Nov. 21, 1969, abandoned. This application July 14, 1971, Ser. No. 162,488
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **7 Claims**

A system is disclosed which locates open and short-circuit faults on a transmission line by sensing a minimum occuring at

the input end of the line. The apparatus comprises a variable frequency test signal source coupled to the input of an amplifier the output of which is adapted for connection to the input end of the transmission line. The frequency of the test signal is varied until a minimum is sensed at the output of the amplifier



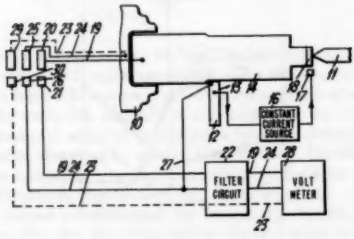
indicating the presence of a fault on the line. The location of the fault, that is, the distance from the input end of the line to the fault, is determined by the frequency of the source signal at which the minimum is produced. Means are provided in the system for resolving the ambiguity between an open-circuit fault and a short-circuit fault.

3,728,621

APPARATUS FOR MEASURING THE WEAR OF CUTTING EDGES OF CUTTING TOOLS

Edward Hilary Frost-Smith, Peubyn Ballylesson, Drumbo; Henry Richard Marten, 33 Cloverbill Park BT42JW, and Alfred John Wilkinson, 33 Glenholm Crescent BT84LT, both of Belfast, all of Northern Ireland

Filed May 13, 1969, Ser. No. 824,239
Int. Cl. G01r 27/02
U.S. Cl. 324—65 R **1 Claim**



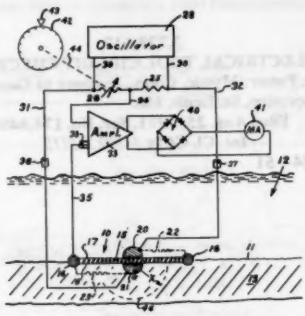
Method and apparatus for measuring a clearance face wear of cutting tools during the cutting action of a cutting tool on a workpiece comprising a first electrical circuit for feeding electric current through an interface between the workpiece secured in a clamping mechanism and a cutting tool, the workpiece and the tool being otherwise insulated from each other and adapted to be in relative motionary relationship one to the other, the first circuit also including a current source and a slip ring assembly, and a second electrical circuit containing at least one slip ring assembly, the workpiece, the tool and a voltmeter, where upon by feeding a constant current through the first circuit a value of voltage drop in the tool/workpiece interface is obtained from the voltmeter, thereby enabling the resistance between the workpiece and the tool to be calculated the value of resistance varying with the area of contact between the workpiece and the tool, this area depending on the amount of clearance face wear.

3,728,622

METHOD OF AND APPARATUS FOR MEASURING IN SITU THE FORMATION FACTOR

Cecil E. Williams, 2753 Peter St., Honolulu, Hawaii

Filed Sept. 28, 1971, Ser. No. 184,446
Int. Cl. G01v 3/06
U.S. Cl. 324—9 **13 Claims**



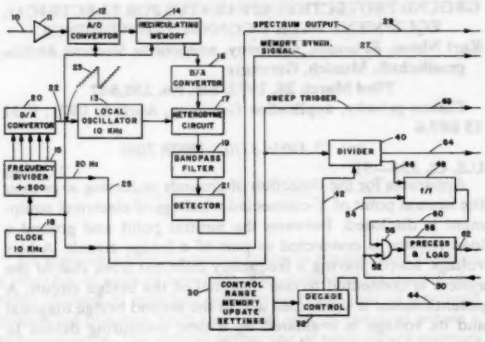
A method of and apparatus for measuring in situ the formation factor is disclosed. The formation factor is the ratio of the resistivity of a water saturated sediment to the resistivity of the interstitial water of the sediment. To this end the sediment is insulated from the water by an insulating sheet provided with a circumferential electrode and two opposed electrodes disposed on opposite surfaces of the sheet. By applying an alternating current between these three electrodes the ratio of the resistivity between the electrode in contact with the sediment and the circumferential or counter electrode on the one hand and the resistivity between the opposed electrode in contact with the water and the counter electrode may be measured. This may conveniently be effected by a Wheatstone bridge to which an alternating current is applied. The bridge may be balanced by adjusting one of the resistors thereby to measure the ratio of the resistance of the sediment to the resistance of the water. The electrode arrangement may be modified to form in essence a sled which may be moved by a boat or a ship across the water-sediment interface.

3,728,623

METHOD AND APPARATUS FOR SPECTROGRAM DISPLAY CONTROL

Carl E. Dubois, San Diego, Calif., assignor to Spectral Dynamics Corporation of San Diego, San Diego, Calif.

Filed March 15, 1972, Ser. No. 234,964
Int. Cl. G01r 23/16, 27/02
U.S. Cl. 324—77 B **16 Claims**



A spectrogram display control unit that provides control of the displaying of frequency spectrum data in a composite X-Y

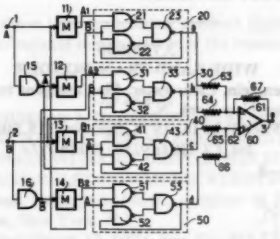
display having multiple spectra data displayed in line by line arrangement, with the line spectra data being updated and refreshed serially. The spectra data is restored in a circulating memory shift register that receives updated information in timed sequence from another memory unit, which other memory unit provides time-controlled, interrogation of frequency data. The other memory unit can also average spectra data stored therein and supplied to the circulating memory unit at selected time intervals, that prevents loss of data between updating times.

3,728,624

PHASE METER FOR COMPARING RECTANGULAR WAVES

Yves Salle, Boulogne, and Marcel Pincemin, Ris Orangis, both of France, assignors to Compagnie Industrial Des Telecommunications, Cit-Alcatel, Paris, France

Filed Feb. 25, 1972, Ser. No. 229,338
Int. Cl. G01r *25/00*
U.S. Cl. 324—83 A 7 Claims



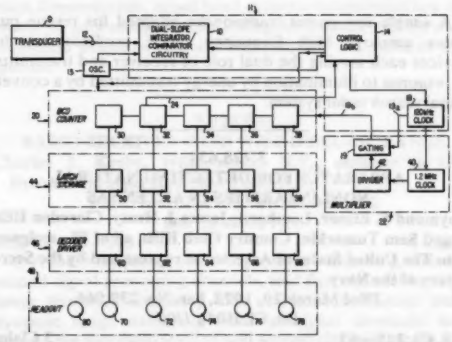
A large-band phase meter operating by the evaluation of displaced rectangular waves being applied to phase measurements, particularly between two waves having the same frequency but different cyclic ratios furnishing measurements independent of the cyclic ratio.

3,728,625

DIGITAL INDICATOR WITH PULSE MULTIPLIER FOR PROVIDING CONTINOUS FULL SCALE RESOLUTION

Donald A. Senour, Carlisle, and Janusz S. Kobel, Cambridge, both of Mass., assignors to BLH Electronics Inc., Waltham, Mass.

Filed Nov. 24, 1970, Ser. No. 92,412
Int. Cl. G01r *17/06, 15/08;* H03k *13/20*
U.S. Cl. 324—99 D 6 Claims



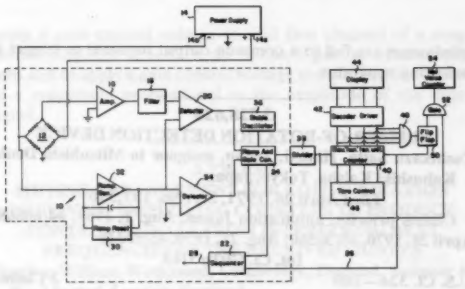
An analog-to-digital converter of a dual-slope integrating voltage-to-proportional-count device cooperates with a pulse multiplier to control full-scale resolution of measurements for different transducer inputs, the fixed-rate pulse output of the converter alternately being coupled to a binary-coded decimal counter for a preselected count interval during first predetermined integrating periods while an unknown transducer input is sampled, and being in synchronized control of the supply of pulses to the same counter at selected multiplied rates during second periods while a reference potential is referred to; a visual readout operated by the counter indicates the measurements with a resolution improved by the pulse-multiplication.

3,728,626

ELECTRONIC MEASURING SYSTEM

Alec T. Douglas; Haydon C. Thomas, both of St. Johnsbury, and Harry J. Keen, Waterford, all of Vt., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed March 25, 1971, Ser. No. 128,065
Int. Cl. G01r *17/06, 27/02*
U.S. Cl. 324—99 D 18 Claims



The electronic measuring system includes a transducer to develop an analog signal which is a function of a value to be measured, a reference signal generating unit, a first comparison unit to provide a start signal when a reference signal from the reference generating unit reaches a coincidence point with the system ground potential and a second comparison unit to provide a stop signal when the reference and analog signals reach a coincidence point. All of these units are powered from a single power source and referenced to ground potential. A counter system receives and registers pulses in the interval between the start and stop signals and includes a first counter which is preset below zero and a net counter which is activated to count pulses after the first counter reaches zero. A ramp reset circuit is provided to actively drive the reference signal from the reference generating unit to a quiescent state when the stop signal is provided.

3,728,627

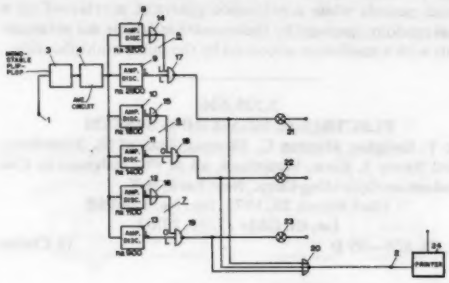
APPARATUS FOR SELECTING DIFFERENT GENERATOR OUTPUT RANGES IN ACCORDANCE WITH THE SPEED OF A MOTOR DRIVING THE GENERATOR

Hans-Gunther Petersen, 318 Wolfsburg, and Heiko Requardt, 317 Gifhorn, both of Germany, assignors to Volkswagenwerk AKT, Wolfsburg, Germany

Filed Jan. 26, 1971, Ser. No. 109,900
Claims priority, application Germany, Jan. 30, 1970, P 20 04 100.3
Int. Cl. G01r
U.S. Cl. 324—158 R 5 Claims

Apparatus comprising a plurality of voltage discriminator circuits selects different amplitude ranges of the electrical output of a generator in accordance with the rotational speed of the motor driving the generator. Each of the voltage discriminator circuits includes a first and a second voltage amplitude discriminator which are respectively actuated by an electrical signal representing the speed of said motor above and below a given amplitude. Each voltage discriminator circuit also includes gating circuitry for producing an output when one of the first and second amplitude discriminators is actuated so that each voltage discriminator circuit determines

an electrical signal representative of a different rotational speed of the motor. The outputs of the plurality of voltage dis-



criminators are fed to a common output terminal to trigger a recording apparatus.

3,728,628

NUMBER-OF-ROTATION DETECTION DEVICE

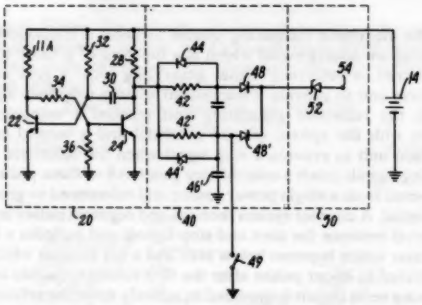
Toshikazu Saita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed April 26, 1971, Ser. No. 137,360

Claims priority, application Japan, Aug. 1, 1969, 44/60868; April 28, 1970, 45/36560; Aug. 21, 1970, 45/83321

Int. Cl. G01p 3/48

U.S. Cl. 324—169 **3 Claims**



The disclosed devices comprise a monostable multivibrator applied with periodic trigger pulses resulting from the rotation of the engine. If the engine has a speed of rotation less than a predetermined speed a voltage charged on a capacitor within the pulse period in the stable state of the multivibrator reaches a breakdown voltage of a Zener diode to produce an output from the latter. Otherwise the voltage across the capacitor does not reach the breakdown voltage to produce no output from the diode.

Two capacitors may charge or discharge with different time constants in the stable state of the multivibrator while one of the capacitors is disabled in accordance with whether the actual speed is higher or lower than the predetermined speed.

3,728,629

AUTOMATIC TIME INTERVAL RANGING CIRCUIT FOR DELAY INTERVAL MEASUREMENTS

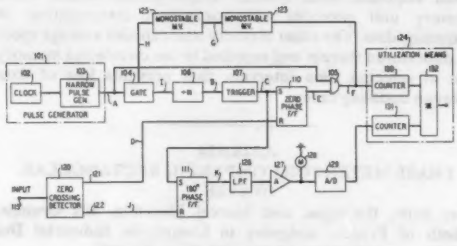
David Leonard Favin, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 10, 1971, Ser. No. 197,411

Int. Cl. G04f 9/00, 11/06

U.S. Cl. 324—186 **12 Claims**

Delay time intervals are measured by employing a flip-flop circuit which is SET by a reference pulsating signal and RESET by a test signal. A desired measurement precision is obtained by causing the flip-flop to be SET and RESET within the interval between adjacent pulses developed by a reference clock. This is achieved automatically by selectively shifting the phase of the reference pulsating signal waveform to delay



SETTING of the flip-flop. The incremental shift in the reference signal waveform is directly related to the number of reference pulses occurring during the initial interval in which the flip-flip is SET and RESET.

3,728,630

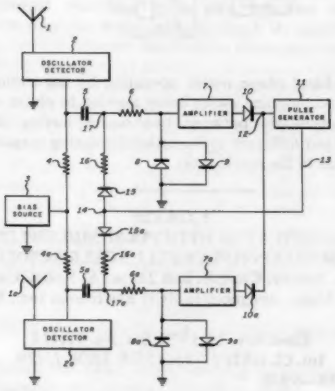
WIDE BAND TRANSPONDER

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,508

Int. Cl. G01s 9/56; H04b 7/14

U.S. Cl. 325—8 **11 Claims**



A simple low-power transponder adapted for rescue purposes employs high frequency diode oscillator-detector devices each serving the dual role of receiver and transmitter in response to illumination by energy transmitted by a conventional search radar system.

3,728,631

APPARATUS FOR DETECTING NATURAL NONLINEARITIES IN ANTENNAS

Raymond F. Elsner, Lombard; James J. Husty, Claredon Hills, and Sam Tumarkin, Country Club Hills, all of Ill., assignors to The United States of America as represented by the Secretary of the Navy

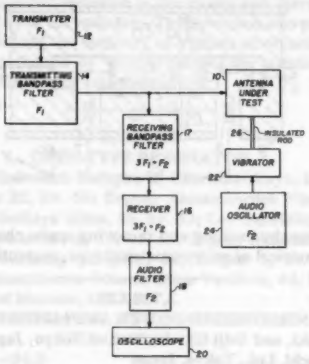
Filed March 29, 1972, Ser. No. 239,066

Int. Cl. H04b 1/00

U.S. Cl. 325—67 **3 Claims**

A method for determining whether an antenna possesses natural nonlinearities by detecting and classifying radio frequency interference sources existing in the antenna. An alternating current at frequency F_1 is passed through a suspected nonlinearity to thereby create F_1 harmonic signals. The suspected nonlinearity is then exposed to mechanical

forces at frequency F_2 by means of a vibrator to cause F_1 and F_2 to interact and generate intermodulation product signals.



Detection of these intermodulation product signals indicates the presence of natural nonlinearities in the antenna.

3,728,632

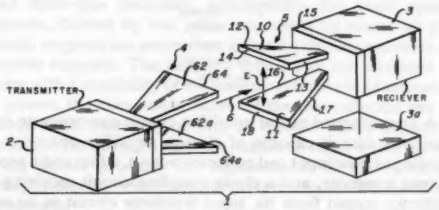
TRANSMISSION AND RECEPTION SYSTEM FOR GENERATING AND RECEIVING BASE-BAND DURATION PULSE SIGNALS WITHOUT DISTORTION FOR SHORT BASE-BAND PULSE COMMUNICATION SYSTEM

Gerald F. Ross, Lexington, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed March 12, 1971, Ser. No. 123,533

Int. Cl. H04b *1/00*

U.S. Cl. 325—38 R **8 Claims**



An electromagnetic signal communication system utilizing short base-band pulse signals of sub-nanosecond duration employs dispersionless, broad band antenna transmission line elements for generating and preserving the character of the short base-band pulses in respective transmitter and receiver subsystems.

3,728,633

RADIO RECEIVER WITH WIDE DYNAMIC RANGE

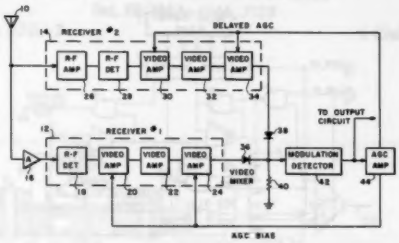
Charles J. Krebs, Williamsville, N.Y., assignor to GTE Sylvania Incorporated, New York, N.Y.

Filed Nov. 22, 1961, Ser. No. 154,302

Int. Cl. H04b *1/06*

U.S. Cl. 325—303 **4 Claims**

4. A radio frequency receiving system comprising, first and second signal processing channels, said first channel having a lower threshold sensitivity than said second channel and a dynamic range extending from its signal threshold level beyond the threshold level of said second channel, means connecting the input of each of said channels to a common source of modulated signals, a circuit connected to the output of each channel for combining the signals processed thereby, a demodulator connected to said combining circuit, and an automatic gain control circuit connected to the output of said demodulator and to said channels and operative in response to input signals of magnitude within the dynamic range of said first channel to apply a gain control voltage only to said first channel and operative in response to input signals of magnitude within the dynamic range of said second channel to



apply a gain control voltage to said first channel of a magnitude sufficient to reduce the channel gain to substantially zero and to apply a gain control voltage to said second channel of a magnitude proportional to the amplitude of the input signal.

3,728,634

MUTING ARRANGEMENT FOR COMMUNICATION RECEIVERS EMPLOYING COUNTERS TO PRODUCE CONTROL SIGNALS FROM INTERFERING BEAT FREQUENCIES OF THE RECEIVED SIGNALS

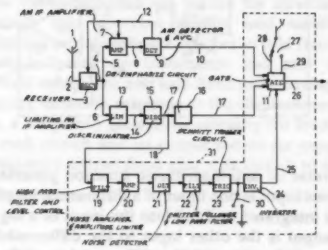
Stephen William Watkinson, Cambridge, England, assignor to Pye Limited, London, England

Filed Jan. 28, 1971, Ser. No. 110,453

Claims priority, application Great Britain, Feb. 5, 1970, 5,515/70

Int. Cl. H04b *1/10*

U.S. Cl. 325—478 **16 Claims**



A squelching arrangement for muting a receiver in the absence of signals received from a plurality of transmitters operating at frequencies offset from the mean frequency to which the receiver is tuned. Interfering beat frequencies of the received signals in either a communication or auxiliary channel are counted to produce a squelch control signal. This control signal then operates a gating circuit that passes the received signals if the interfering beats are of a predetermined amplitude and frequency.

3,728,635

PULSED SELECTABLE DELAY SYSTEM

Robert M. Eisenberg, Derwood, Md., assignor to The Singer Company, Binghampton, N.Y.

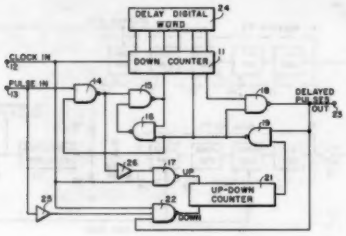
Filed Sept. 8, 1971, Ser. No. 178,757

Int. Cl. H03k *5/13*

U.S. Cl. 328—55 **4 Claims**

This is a system which provides a train of output pulses that duplicate a train of input pulses but which output pulses are delayed a selective amount in time. A first counter receives a digital word which represents the amount of time that the output is to be delayed after the input. A clock supplies the

counter with timed pulses, and when the capacity of the counter has been reached, its output initiates the output pulse. A second counter counts upwardly during the period of time that an input pulse exists. Upon decay of the input pulse, the



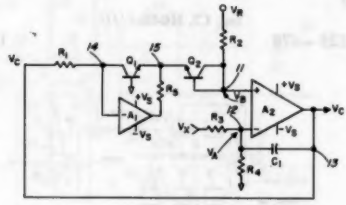
second counter is inhibited from further counting until the output from the first counter is generated. At that time, the second counter begins counting down, and when it reaches zero, an output signal is generated which terminates the output pulse.

3,728,636

INVERSE LOGARITHMIC FUNCTION GENERATOR

Charles W. Hill, Linthicum Heights, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 28, 1971, Ser. No. 212,924
Int. Cl. H03k *17/00*
U.S. Cl. 328—145 **8 Claims**



An inverse or anti-logarithmic function generator wherein the systems input is one input of a differential amplifier whose output is integrated and fed into the input of a log generator, whose output is the other input to the differential amplifier. The integrated output of the differential amplifier is the inverse log of the systems input.

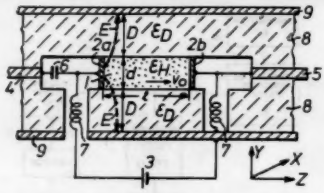
3,728,637

SEMICONDUCTOR ARRANGEMENT FOR NONRECIPROCAL AMPLIFICATION OR GENERATION OF OSCILLATIONS IN THE MICROWAVE RANGE

Reinhart Engelmann, Ulm/Donau, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Aug. 27, 1970, Ser. No. 67,500
Claims priority, application Germany, Aug. 28, 1969, P 19 43 676.1; Feb. 27, 1970, P 20 09 142.3
Int. Cl. H03f *3/04*
U.S. Cl. 330—5 **13 Claims**

A semiconductor arrangement for nonreciprocal amplification or for the generation of high frequency oscillations in which high frequency electromagnetic energy is coupled into a semiconductor layer which exhibits a negative differential charge carrier mobility in a direction perpendicular to the applied drift field and has a predetermined layer thickness in this perpendicular direction thereby exciting properly growing space charge waves. The arrangement may be geometrically symmetrical in this perpendicular direction and may have either symmetrical or antisymmetrical coupling and decoupling means for the high frequency electromagnetic



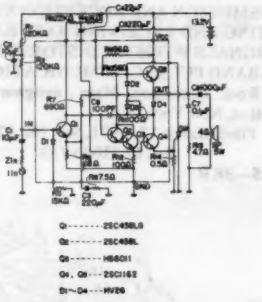
energy thereby exciting and removing space charge waves of the symmetrical or antisymmetrical type, respectively.

3,728,638

TRANSISTORIZED POWER AMPLIFIER CIRCUIT

Kunio Seki, and Seiji Okuda, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 13, 1971, Ser. No. 162,142
Claims priority, application Japan, July 13, 1970, 45/60626
Int. Cl. H03f *3/42*
U.S. Cl. 330—18 **3 Claims**



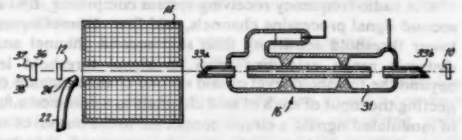
A transistorized power amplifier circuit comprises an input transistor circuit capable of class-A amplifier operation according to base input and collector output, a first and a second output transistor, and a diode coupling circuit receiving the collector output from the input transistor circuit as an input signal thereof for alternatively driving the output transistors into conduction at each successive half cycle of the input signal. A DC negative feedback circuit is connected between the output terminal of the output transistors and the emitter of the input transistor, and all the transistors are of the same conduction characteristic.

3,728,639

ELECTROMAGNETIC INTENSIFIER

Harold W. Scott, Ridgefield, and Monroe R. Kelemencky, Woodbury, both of Conn., assignors to Basic Sciences Corp., Bethel, Conn.

Filed Aug. 4, 1970, Ser. No. 60,789
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **10 Claims**



An apparatus for varying the intensity of electromagnetic radiation, having a soure of polarized electromagnetic radia-

tion, a cavity for receiving the radiation from the source and reflecting said radiation in the cavity, and means associated with the cavity for adjustably varying the angular rotation of the electromagnetic radiation in the cavity and thereby varying the intensity of the radiation. The invention also provides a method of varying the intensity of a beam of polarized electromagnetic radiation by varying the angular rotation in the plane of polarization of said radiation.

3,728,640

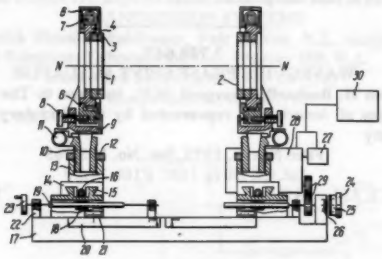
OPEN-TYPE RESONATOR

Nikolai Vladimirovich Bulygin, B. Cherkizovskaya, kvartal 8-11, korpus 21, kv. 60; Evgeny Alexandrovich Vinogradov, Kozhevnicheskaya ulitsa, 1b, kv. 33; Lev Genrikhovich Gugel, ulitsa Medvedeva, 14, kv. 33; Evgeny Mikhailovich Dianov, Michurinsky prospekt, 12, korpus 1, kv. 47, and Natalia Alexandrovna Irisova, ulitsa Vavilova, 44, korpus 3, kv. 74, all of Moscow, U.S.S.R.

Filed March 29, 1972, Ser. No. 239,169

Int. Cl. H01s *3/08*

U.S. Cl. 331—94.5 **1 Claim**



An open-type resonator, substantially, for quasi optical channels, formed by two reflectors which by means of permanent magnets are secured on adjusting devices mounted on movable supports. The supports themselves are mounted on guides with a possibility of movement with the aid of micrometer screws, the micrometer screw of the rear reflector can be rotated either manually or with an electric motor through a speed reducer having a variable reduction ratio, while the use of the guides provides for displacement of the reflectors through distances which considerably overcome the operating wavelength.

3,728,641

VARIABLE TEMPERATURE COMPENSATING CAPACITOR FOR CRYSTAL OSCILLATORS

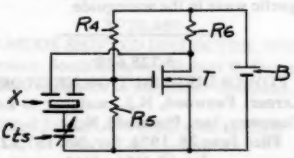
Kinji Fujita, and Hiromitsu Mitsui, both of Nagano, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 3, 1971, Ser. No. 168,656

Claims priority, application Japan, Aug. 6, 1970, 45/68321; Aug. 6, 1970, 45/68322

Int. Cl. H03b *5/30*

U.S. Cl. 331—116 R **6 Claims**



A temperature sensitive capacitor having a dielectric such as $BaTiO_3$, wherein capacitance varies in response to temperature, is provided with means for manually changing the capacitance thereof either in a stepwise manner or continuously.

3,728,642

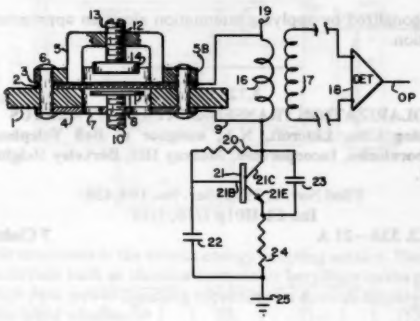
CAPACITOR MICROPHONE

James P. Campman, Silver Spring, Md., assignor to Vidar Laboratories, Inc., Kensington, Md.

Filed Nov. 23, 1971, Ser. No. 201,552

Int. Cl. H03c *1/46, 3/28*

U.S. Cl. 332—2 **6 Claims**



The invention concerns improvements in a capacitor type microphone, comprising a printed circuit board having an aperture therethrough at one end thereof, a fixed but spacially adjustable plate member mounted in said aperture, a plastic membrane coated on one side with a magnetic conductive material stretched across said aperture, a magnet mounted adjacent said membrane and adjustable relative thereto for attracting the membrane thereto, means for directing sound waves through said aperture against said membrane to variably displace said membrane relative to said fixed plate, a tank circuit including an inductance and said capacitor formed by said membrane and said fixed plate having its resonant frequency varied in response to the displacement of said membrane, a frequency generating circuitry for feeding energy to said tank circuit and an output means for coupling the variable frequency output from said tank circuit to a point of utilization.

ERRATUM

For Class 332—26 see:
Patent No. 3,728,645

3,728,643

APPARATUS FOR TRANSFORMING NONORTHOGONAL ELLIPTICALLY POLARIZED WAVES INTO ORTHOGONAL LINEARLY POLARIZED WAVES

Ta-Shing Chu, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

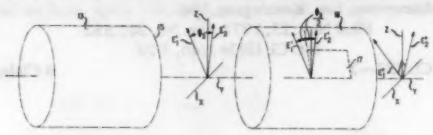
Filed Nov. 1, 1971, Ser. No. 194,361

Int. Cl. H01p *1/16, 1/18*

U.S. Cl. 333—21 A **13 Claims**

Apparatus for transforming first and second nonorthogonal elliptically polarized waves into orthogonal linearly polarized waves is disclosed. Linearization of the elliptical waves is achieved by applying a phase shift along at least one of two orthogonal directions, the latter directions being those for which the components of the first wave therealong and the

components of the second wave therealong have the same phase difference. The resultant linear waves are then



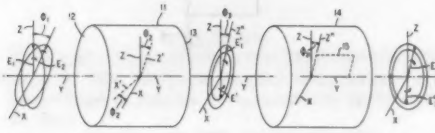
orthogonalized by applying attenuation along an appropriate direction.

3,728,644

POLARIZATION TRANSFORMATION APPARATUS

Ta-Shing Chu, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 1, 1971, Ser. No. 194,436
Int. Cl. H01p *1/16, 1/18*
U.S. Cl. 333—21 A **7 Claims**



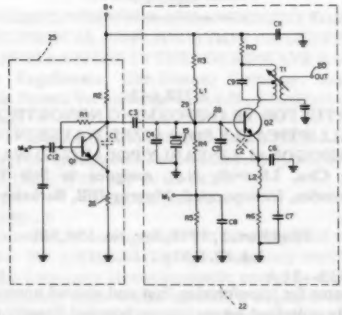
Apparatus for transforming two elliptically polarized waves into two oppositely rotating circularly polarized waves. The two elliptically polarized waves are first transformed by a phase-shifter into two other oppositely rotating elliptically polarized waves having parallel major and minor axes and equal axial ratios. Attenuation equal to the reciprocal of the axial ratio is then applied to both the transformed elliptical waves thereby simultaneously converting the oppositely rotating elliptical waves into two oppositely rotating circular waves.

3,728,645

HIGH MODULATION INDEX OSCILLATOR-MODULATOR CIRCUIT

Charles Rosen, Philadelphia, and Martin J. Arcaro, Penndel, both of Pa., assignors to Microcom Corporation, Horsham, Pa.

Filed May 20, 1971, Ser. No. 145,185
Int. Cl. H03c *3/28*
U.S. Cl. 332—26 **2 Claims**



An oscillator-modulator circuit is disclosed wherein a high modulation index is obtained by shunting across the crystal of an oscillator a first capacitance derived across the output terminals of a modulation amplifier transistor and a second capacitance derived across the input terminals of the oscillator transistor, such first and second capacitances being time varied by the modulation signal. Oscillator startup under low temperature conditions is aided by circuit delay in coupling the effective capacitance of the modulator amplifier transistor in shunt with the crystal, thereby providing higher closed loop gain of the oscillator during the initial start-up time period.

3,728,646

ACOUSTIC DELAY LINE

Anthonie Louis Zijlstra, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 738,394, June 20, 1968, abandoned. This application Feb. 25, 1971, Ser. No. 119,004
Int. Cl. C03c *3/30, 3/04;* **H03h** *7/30*
U.S. Cl. 333—30 R **2 Claims**

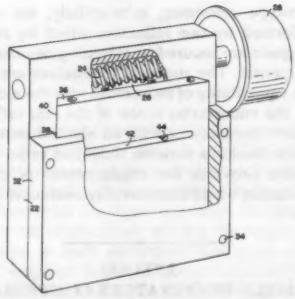
A glass for an acoustic delay line which consists of SiO_2, Al_2O_3, B_2O_3 and an oxide of a bivalent metal and satisfies the requirement that $-5\times10^{-6} < \Sigma_i \alpha_i x_i < +5\times10^{-6}$ where α_i is the temperature coefficient of the rate of propagation in the range of 20°–70° C for the oxide component i and x_i is the molar fraction of that component.

3,728,647

WAVEGUIDE PHASE SHIFT ACTUATOR

William H. Bushnell, Liverpool, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 4, 1971, Ser. No. 195,765
Int. Cl. H01p *1/00;* **F16h** *21/24*
U.S. Cl. 333—98 R **1 Claim**



An actuator for shifting the phase of an electromagnetic wave inside a waveguide. A worm gear connection controls the input to the actuator and drives a slide in a bi-directional movement. This slide is connected to a platform that controls the position of rods inside the waveguide. The position change of the rods in the waveguide causes a shift in the phase of the electromagnetic wave in the waveguide.

3,728,648

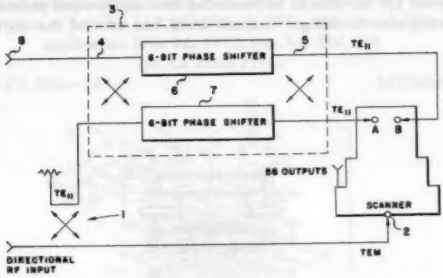
POWER DISTRIBUTION NETWORK

David S. Lerner, Fanwood, N.J., assignor to Lockheed Electronics Company, Inc., Plainfield, N.J.

Filed June 28, 1971, Ser. No. 157,222
Int. Cl. H01p *5/12*
U.S. Cl. 333—6 **5 Claims**

A power distribution and control network wherein two crossed TE_{11} modes and a TEM mode are derived and then combined in a radial transmission line. The relative amplitudes and phases are adjusted to yield a "cosine-on-a-pedestal" amplitude distribution. Then, preserving phase of

the two TE_{11} modes, the pair is shifted in amplitude with respect to the TEM mode, and the "cosine-on-a-pedestal" distribution is made to rotate. The resulting signal is applied to the radiators of a phased array.

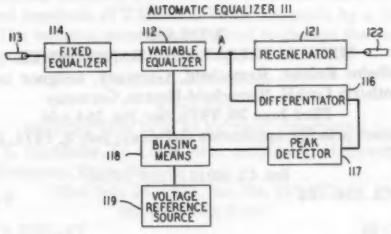


3,728,649

AUTOMATIC EQUALIZER FOR DIGITAL CABLE TRANSMISSION SYSTEMS

Frederick Donald Waldhauer, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed April 24, 1972, Ser. No. 247,147
Int. Cl. H04b 3/04; H03h 7/16
U.S. Cl. 333—18 **5 Claims**



An automatic equalizer for digital cable transmission systems compares the differentiated and peak detected pulse output of a variable equalizer to an output level of a voltage reference source to produce a first control signal. A second control signal is derived from the first control signal and both control signals vary the amount of equalization provided by the variable equalizer to equalize the incoming pulses from a remote station. The relationship of the two control signals enables one signal path of the variable equalizer, which contains three signal paths, to be used alone or in combination with one of the other two signal paths. The other two signal paths provide transfer characteristics which alter the transfer characteristic of the transmission cable such that the effective electrical length of the cable is either increased or decreased and an appropriately equalized pulse output is available from the variable equalizer.

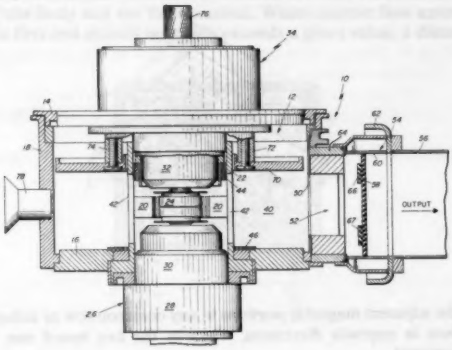
3,728,650

GHOST-MODE SHIFTED DIELECTRIC WINDOW

Robert J. Forman, Southboro, and Robert R. Dame, Needham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed July 23, 1971, Ser. No. 165,548
Int. Cl. H01p 1/00
U.S. Cl. 333—98 P **16 Claims**

The invention discloses a dielectric window serving as an interface between different atmospheric media and/or propagating structures incorporating means for detuning ghost-modes to frequencies outside of a desired tuning range. The window is provided with a thicker cross-sectional interface of a compatible dielectric material principally disposed in the diametrically spaced regions of zero electric field intensity of the normal resonant frequency resonant mode. Crossed field devices having tunable coaxial cavity resonators employ the applicable structures in the output energy coupling section. Dielectric materials such as alumina ceramic or beryllium oxide provide high peak power handling capability for devices employing the disclosed window.

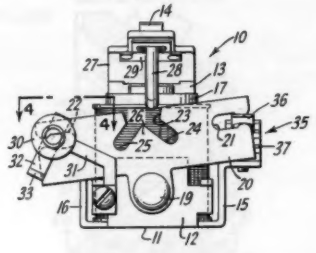


3,728,651

BISTABLE RELAY

Jack V. Foster, Fort Branch, Ind., assignor to AMF Incorporated, New York, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,374
Int. Cl. H01h 9/20
U.S. Cl. 335—170 **11 Claims**



A bistable impulse relay having a rocker member pivotally mounted to move back and forth between two terminal positions. A switch means with leaf spring contact arms is actuated by the rocker member. The rocker member being provided with permanent magnet means releasably retaining the rocker member in at least one terminal position.

3,728,652

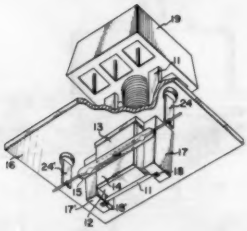
KEY APPARATUS AND ARRANGEMENT THEREOF

Tatsuo Nishikawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed , Ser. No. 54,898
Claims priority, application Japan, July 18, 1969, 44/57133
Int. Cl. H01h 41/08, 3/12
U.S. Cl. 335—207 **6 Claims**

A key apparatus includes a magnetic reed switch and at least one magnet forming a magnetic portions for energizing the reed switch. the magnetic portion having a plurality of magnetic poles disposed to produce substantially parallel magnetic fluxes opposite in sense so that the reed switch is maintained open under the influence of both of said substantially parallel magnetic fluxes opposite in sense when the key is in normal position and that the reed switch is closed under the influence of one of said magnetic fluxes. A plurality of such

key apparatuses are arranged so as to form columns and rows and in such a manner that all the magnetic portions in any common column or row faces in the same direction but that the adjacent magnetic portions in any common row or column face in opposite directions, whereby the key board can be compact.



3,728,653

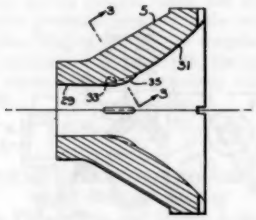
CONTOURED CORE FOR TOROIDAL YOKES

Charles Edward Torsch, Emporium, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,378

Int. Cl. H01f 7/00

U.S. Cl. 335—210 **10 Claims**



A deflection yoke for a cathode ray tube includes a core member having at least one inwardly protruding ridge member and winding of wires toroidally wrapped about the core member and including a flux altering means in the form of a winding gap centrally disposed about the ridge member.

3,728,654

SOLENOID OPERATED PLUNGER DEVICE

Kiichiro Tada, Yao-shi, Osaka, Japan, assignor to Hoshidenki-Seizo Kabushiki-Kaisha, Yao-shi, Osaka-fu, Japan

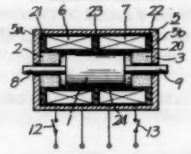
Filed Sept. 20, 1971, Ser. No. 181,727

Claims priority, application Japan, Sept. 26, 1970, 45/95447

Int. Cl. H01f 7/08

U.S. Cl. 335—234 **6 Claims**

Within a cylindrical yoke of magnetic material are disposed first and second axially spaced coils in concentric relationship therewith. A first permanent magnet is arranged inside the first coil in abutting relation with one of the end plates of the yoke, and a second permanent magnet is arranged inside the second coil in abutting relation with the other end plate. A movable magnetic body is located inside the first and second coils for movement between the first and second permanent magnets. A plunger extends from one end of the movable magnetic body through a permanent magnet and the yoke to the exterior thereof. A current pulse supplied to the first coil causes the movable body to be attracted to the first permanent magnet, and a current pulse supplied to the second coil causes the movable body to be attracted to the second permanent magnet.



3,728,655

MEDIUM FREQUENCY TRANSFORMER

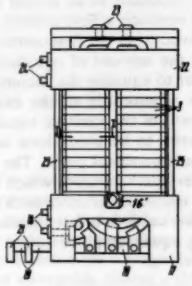
Friedhelm Reinke, Remscheid, Germany, assignor to AEG-Elotherm GmbH, Remscheid-Hasten, Germany

Filed June 20, 1972, Ser. No. 264,456

Claims priority, application Germany, July 8, 1971, P 21 33 987.7

Int. Cl. H01f 27/08, 27/30

U.S. Cl. 336—62 **9 Claims**

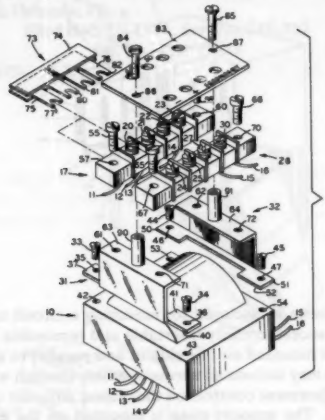


A medium frequency transformer having a single layer flat secondary winding, two flat layers forming a primary winding, and placed face to face, and a plurality of ferrite core members. According to this invention the faces of the secondary winding and of the primary winding layers each include two band shaped zones which are connected at their ends by U-shaped zones. The core members are stacked to form hollow columns embracing the parallel band-shaped zones. A clamping member is mounted at each end of the core stack columns.

3,728,656
TRANSORMER AND TERMINAL ASSEMBLY

Ralph E. Neuber, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Division of Ser. No. 112,863, Feb. 5, 1971, abandoned. This application June 26, 1972, Ser. No. 266,438
Int. Cl. H01f 21/12
U.S. Cl. 336—147 10 Claims

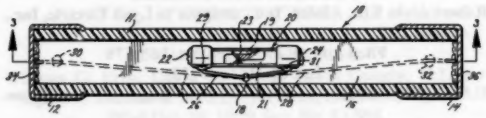


A terminal assembly is shown wherein connections between selected terminals of a terminal block are made by a jumper strip. The terminal assembly is utilized to change the winding arrangement of a power transformer.

3,728,657
PROTECTOR FOR ELECTRIC CIRCUITS

Craig L. McAlister, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed July 26, 1971, Ser. No. 165,972
Int. Cl. H01h 85/08
U.S. Cl. 337—17 20 Claims



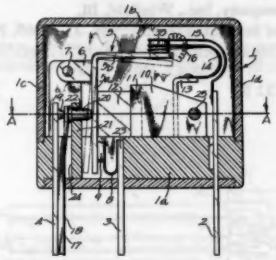
An electric fuse has a current-sensing section and an arc-quenching section. The current-sensing section will respond to potentially hurtful overloads and to short circuits to initiate circuit-opening action, but the arc-quenching section will immediately take over and instantly complete that circuit-opening action. Because it does not have to complete the circuit-opening action, the current-sensing section can be made much smaller and much less expensively than can the current-sensing section of an electric fuse which must initiate and then complete the circuit-opening action.

3,728,658
AUTOMATICALLY RESETTING RELAY

Yasuo Kasahara, Tokyo, Japan, assignor to Kabushiki-Kaisha Nakatani, Tokyo, Japan; a part interest

Filed Jan. 13, 1972, Ser. No. 217,603
Claims priority, application Japan, Jan. 19, 1971, 46/1782 (utility model)
Int. Cl. H01h 61/01
U.S. Cl. 337—90 5 Claims

A permanent magnet is secured within an insulating casing, and on opposite sides thereof, first and second terminals are mounted in the bottom plate of the casing. An L-shaped body of magnetic and electrically conductive material is pivotally mounted within the casing with its one limb being adapted to be attracted by the magnet and having a contact for circuit-opening and-closing purpose interposed in the path to the second terminal. Bimetal is connected between the other limb of the body and the first terminal. When current flow across the first and second terminals exceeds a given value, a distor-

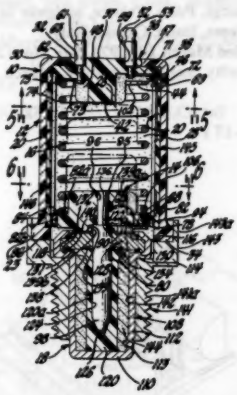


tion of the bimetal due to Joule heat and a reduction in the magnetic permeability of the body due to Joule heat effect in combination a movement of the body away from the magnet, whereby the contact is opened. The body is automatically reset, i.e., attracted by the magnet upon recovery of the bimetal from distortion and increase of the permeability of the body.

3,728,659
THERMOELECTRICAL SWITCH

Lynn S. Brock, Williamsville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 21, 1972, Ser. No. 219,708
Int. Cl. H01h 37/44
U.S. Cl. 337—315 4 Claims



In a preferred form, this disclosure relates to a thermoelectrical switch having a housing means with terminal means adapted to be connected with electric circuit means, printed circuit means disposed within said housing means and adapted to be connected with said terminal means of said housing means, a piston-like contact carrier which is supported for movement adjacent said printed circuit means between circuit energized and circuit deenergized positions and having a grounded contact means disposed to engage said printed circuit means when said contact carrier is in its circuit energized position, spring means which biases the contact carrier in one direction within said housing, and thermally expansible means which acts in opposition to the bias of said spring means and effects movement of the contact carrier in the opposite direction within said housing means when its temperature is

increasing from a first predetermined temperature toward a second predetermined temperature.

3,728,660

TEMPERATURE RESPONSIVE RESISTANCE ELEMENT FOR A TEMPERATURE SENSITIVE CONTROL SENSOR

Philip F. Finney, Villa Park, Ill., assignor to Thermo-Couple Products Company, Inc., Winfield, Ill.

Division of Ser. No. 878,832, Nov. 21, 1969, Pat. No. 3,650,024. This application July 16, 1971, Ser. No. 163,314

Int. Cl. H01c 7/04

U.S. Cl. 338—22 R 7 Claims

A temperature responsive resistance element for a sensor used in controlling the temperature of a metal, gas or liquid mass wherein the element includes a ceramic core, a temperature sensitive resistance wire wound on the core, wherein the wire has a high coefficient of resistance change with temperature increase, a lead connected to each end of the wire having a low coefficient of resistance change with temperature change, and ceramic insulating means encapsulating the entire element except for end portions of the leads.

3,728,661

MODULAR CABLING SYSTEM

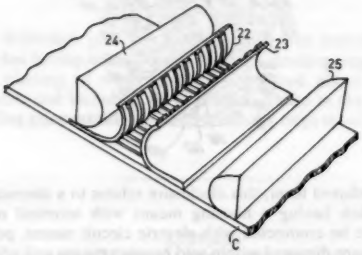
Georges Kassabgi, Paris, France, assignor to Honeywell Information Systems, Italia, Caluso, Italy

Filed March 10, 1971, Ser. No. 122,716

Claims priority, application Italy, March 12, 1970, 21815 A/70

Int. Cl. H01r 11/20; H05k 1/02

U.S. Cl. 339—17 F 2 Claims



A flexible flat cable having a plurality of parallel conductors arranged on an insulating support and covered by an insulating layer is provided with openings formed in the insulating layer located at regular intervals along the cable length. The portions of the cable having the openings are formed into connectors at the user's site, or connectors are provided, one at each of the openings, to produce a modular cable which may be separated into usable lengths.

3,728,662

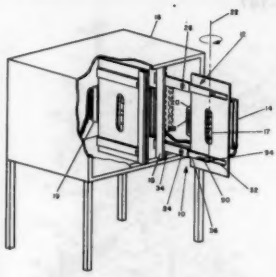
HINGED SLIDE MECHANISM

Jagdish M. Puri, Azusa, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 7, 1972, Ser. No. 223,881

Int. Cl. H02b 1/04; H05k 7/16

U.S. Cl. 339—17 LM 9 Claims



A mechanism is disclosed for mounting a circuit card cage with ready access to easily insertable and removable cards. A card cage is mounted on one side of and parallel to a support plate which may include an access aperture through which test pins and adjustment controls on the closest adjacent card may be reached. The support plate is mounted on the extending ends of a pair of telescoping slide members, the base ends of which are mounted in an electronics enclosure, adjacent one or more fixed female connector blocks into which male connector means on at least one of the circuit cards is received when the slide members are fully telescoped inwardly. The telescoping slide members have elongated transverse dimensions lying in substantially the same plane, and the terminal sections of the slide members are divided about colinear hinge axes lying in the plane, so that the coupled support plate and card cages can be rotated through a substantial angle when the slide members are fully extended.

3,728,663

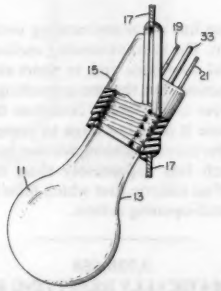
FLEXIBLE LAMPHOLDER

Robert Alvin Kitt, Albion, Ind., assignor to Lyall Electric, Inc., Albion, Ind.

Filed Aug. 3, 1971, Ser. No. 168,578

Int. Cl. H01r 13/52

U.S. Cl. 339—60 R 4 Claims



An improved method and apparatus for providing a sealed lamp and thermoplastic lampholder for an appliance (for example in a refrigerator) is disclosed which employs a low heat conductivity moisture seal between the lamp envelope and the lampholder in conjunction with an integral insulating flap or barrier which separates the external lampholder terminals allowing those terminals to be first individually connected to leads from a source of electrical energy and then encapsulated

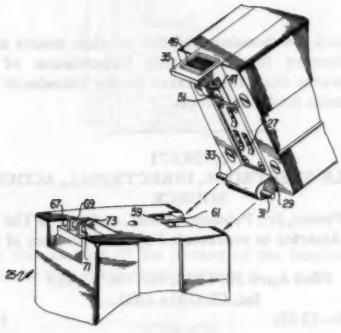
in an insulating medium without the danger that the terminals may become inadvertently shorted during the connecting and encapsulating process.

3,728,664

BATTERY LATCHING MECHANISM

David T. Hurst, Winter Park, Fla., assignor to Repco Incorporated, Orlando, Fla.

Filed Dec. 21, 1971, Ser. No. 210,397
Int. Cl. H01r 13/54
U.S. Cl. 339—91 R 6 Claims



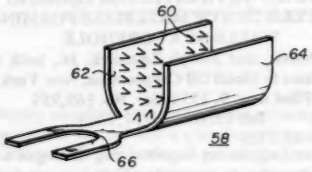
A transceiver radio unit having a detachable battery contained in its own housing. A battery latching mechanism comprising a rigid finger extending downwardly from the lower end of the transceiver housing which mates with a notch in the battery housing. On the opposite side of the transceiver housing is a spring biased button member. Curved posts with camming surfaces are mounted on the battery housing to mate with the button member. Terminals and mating contacts are located on the battery and transceiver housings respectively.

3,728,665

ELECTRICAL CONNECTOR

William G. Frey, Union Township, Union County, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 26, 1970, Ser. No. 83,986
Int. Cl. H01r 11/20
U.S. Cl. 339—97 C 12 Claims



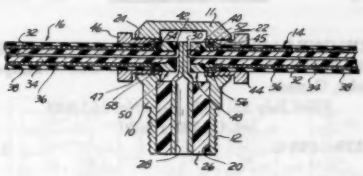
The invention is directed to an improved electrical connector having a calculably determinable number of suitably formed generally upstanding piercing members selectively disposed on at least one surface of a base member and selectively proportioned to provide a predetermined, sufficiently extensive area of contact between the conductor contacting portion of each piercing member and the conductive portion of an adjacently disposed insulated or noninsulated conductor.

3,728,666

SOLDERLESS CONNECTORS OF THE T TYPE

James W. Shirey, Lakeland, Mich., assignor to John Schroeder, Howell, Mich., a part interest

Filed Sept. 20, 1971, Ser. No. 182,078
Int. Cl. H01r 17/04
U.S. Cl. 339—177 R 11 Claims



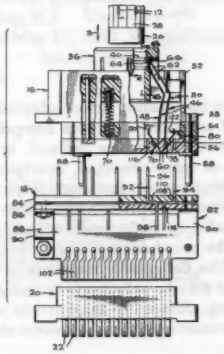
Solderless plug and union connectors for a pair of coaxial shielded cables having a "T" type body provided with pin bearings or socket bearing junctions for contacting the exposed end of an inner conductor from each of a pair of cables disposed in a transverse plane to the body of the connector. The connector body includes a pair of dielectric material washers, each disposed about the dielectric material sleeve surrounding the inner conductor of one of the cables and having a mating step portion formed thereon for engagement with a similar step portion formed on an abutting metallic sleeve member similarly extending through the connector body. The connector assembly includes a threaded cup member slidably fixed to a second connector member for coupling the "T" connector and for drawing the "T" connector and the second connector into tight sealing engagement through the operation of the cup member.

3,728,667

CONTACTOR FOR TESTING CIRCUIT MODULES WITH AXIAL LEADS

Bernd H. Richelmann, San Diego, Calif., assignor to Republic Corporation, Beverly Hills, Calif.

Filed March 3, 1971, Ser. No. 120,483
Int. Cl. H01r 13/10
U.S. Cl. 339—193 P 6 Claims



A contactor head for rapidly making connection with circuit modules which have axially-extending leads that are normally held by a carrier with V-shaped recesses. The head includes a ring-shaped holder with a large aperture for receiving the circle of module leads, and pairs of resilient contactor members spaced about the holder for deflection against the module leads. The contactor members extend through slots in the holder, each slot having an outer wall portion to forcefully deflect the contactor member as the holder is pushed into a housing. The slots are arranged in pairs, with each slot of a

pair spaced from the other slot in the direction of sliding of the holder into the housing. The contactor members are in the form of strips, with tapered outer ends for reception in the V-shaped carrier recesses. A compensating board is provided which has a circle of pins for contacting the contactor members, a row of conductors for receiving a standard plug, and jumpers for connecting the pins to the conductors.

3,728,668

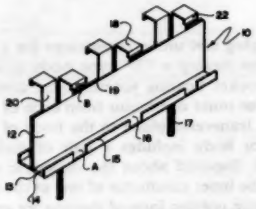
SNAP-ON ONE PAIR BLOCK AND FRAMES THEREFOR

Frederick Frank Reinisch, 475 Scotia St., Winnipeg 17, Manitoba, Canada

Filed July 15, 1971, Ser. No. 162,845

Int. Cl. H01r 9/00

U.S. Cl. 339—198 G **1 Claim**



A stainless steel frame is installed and any number required up to six one-pair blocks can be snapped into place and connected.

3,728,669

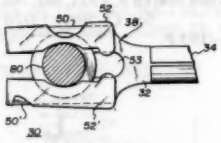
WIRE TERMINATING DEVICE

John J. Churla, Raritan, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed May 4, 1971, Ser. No. 140,214

Int. Cl. H01r 11/22

U.S. Cl. 339—257 **21 Claims**



A mountable wire terminating device adapted to engagingly receive a range of mounting fasteners comprising a dimensionally variable mounting orifice defined, in one embodiment, by a series of interconnected, overlying, spaced, individually deflectable members resiliently responsive to a wide range of fasteners inserted therebetween. Other embodiments include either slidably or deflectably adjustable, selectively contoured frame-like members defining an enclosed variable mounting orifice. The deflectable members of the first mentioned embodiment may be selectively recessed to provide a series of overlapping, differently sized article receiving cavities each suitably proportioned for disposition about a particularly sized fastener.

3,728,670

ULTRASONIC DOPPLER DEVICE

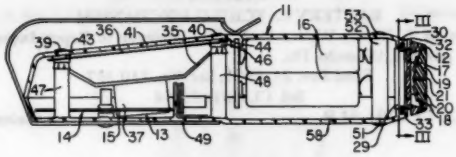
Peter J. Rosauer, Prospect, and Richard C. Sukoski, Norridge, both of Ill., assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Feb. 11, 1971, Ser. No. 114,525

Int. Cl. G01s 9/66

U.S. Cl. 340—1 R **7 Claims**

Portable self-contained ultrasonic doppler device including transmitting and receiving transducer means carried by a support structure, speaker means and electronic doppler circuitry connected to the transducer means and the speaker means, all mounted in a common housing. Attenuation means are provided between the housing and the speaker means and the support structure for attenuating transmission of audio frequency waves from the speaker to the transducer means and to minimize feedback effects.



3,728,671

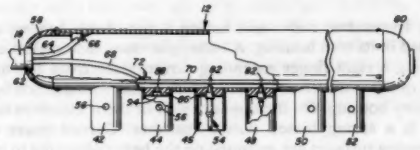
MULTIPLE-ELECTRODE, DIRECTIONAL, ACOUSTIC SOURCE

Adolph M. Poston, Jr., Petaluma, Calif., assignor to The United States of America as represented by the Secretary of the Interior

Filed April 30, 1970, Ser. No. 33,453

Int. Cl. G01v 1/00

U.S. Cl. 340—12 SD **1 Claim**



Concentric electrode pairs of opposite polarity improve the efficiency of a spark-gap acoustic source for marine seismic profiling. One electrode of a pair is tubular; the other is rod-like and positioned axially within the tubular electrode. Among the benefits resulting from the concentric electrode configuration are constant output, directional control, high frequency, efficiency, and a high repetition rate.

3,728,672

METHOD AND APPARATUS FOR LOGGING THE CHARACTERISTICS OF MATERIALS FORMING THE WALLS OF A BOREHOLE

Charles L. Dennis, and Joseph Zemanek, Jr., both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

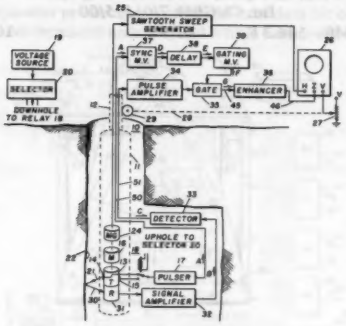
Filed Aug. 9, 1971, Ser. No. 169,959

Int. Cl. G01v 1/34, 1/40

U.S. Cl. 340—15.5 DS **22 Claims**

A method and apparatus for obtaining the log of a borehole employing a transducer assembly which is rotated about and advanced along the axis of a borehole. The transducer assembly includes one or more transmitters of acoustic energy. An excitation pulser is selectively coupled through a relay to the transducer assembly, the relay being energized by surface instrumentation to select the transmitter which is to be operative. Reflections of acoustic energy pulses are converted to electrical reflection signals by the transducer assembly and coupled by signal-enhancing circuitry to the Z-axis of an electron beam display device for intensity modulating the electron beam as it is swept across the face of the display device in accordance with the rotation of the transducer assembly. The signal-enhancing circuitry is selectively operated to non-

linearly change the amplitudes of the reflection signals received from the transducer assembly to either increase or



decrease the contrast of the picture of the borehole as displayed on the face of the display device.

3,728,673

FAULT DISPLAY UNIT FOR A VEHICLE

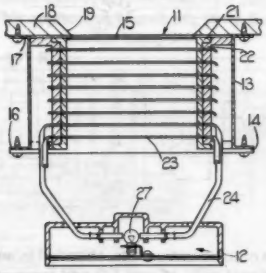
Konrad Werda, 34 Peel Park Avenue, Clitheroe, England

Filed July 27, 1971, Ser. No. 166,440

Claims priority, application Great Britain, Aug. 8, 1970, 38,346/70

Int. Cl. B60q *1/00*

U.S. Cl. 340—52 F **7 Claims**



A fault display unit for a vehicle includes a casing having an aperture at one end thereof and a plurality of translucent display panels mounted in the casing in parallel, spaced relationship with said one end of the casing. A plurality of optical cables are associated with said display panels respectively, one end of each optical cable being positioned adjacent a respective display panel so that light from the optical cable, in use, illuminates the display panel. Each of the display panels is formed with a plurality of indentations in the surface thereof remote from the aperture in the casing, and each of the indentations includes a surface for reflecting some of the light from a respective optical cable, in use, towards the aperture in the casing. The indentations in each display panel are arranged to define a legend so that when a display panel is illuminated an image of the respective legend is produced in the aperture.

3,728,674

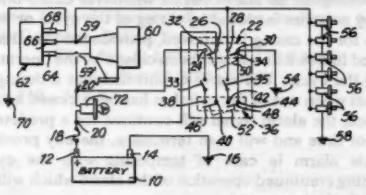
BURGLAR AND PERSONAL PROTECTION ALARM SYSTEM FOR VEHICLES

Robert D. Kahn, Rockville Centre, N.Y., assignor to Fedtro, Inc., Rockville Centre, N.Y.

Filed May 3, 1971, Ser. No. 139,508

Int. Cl. B60r *25/10*

U.S. Cl. 340—63 **6 Claims**



An alarm system includes a signaling device and means for actuation thereof by any one of three methods: firstly, activation by means of removing a plunger switch, which, when removed, closes a normally open circuit; secondly, by means of a push switch which closes a circuit when depressed and opens a circuit when released, and thirdly, by means of an alarm switch. The system is intended for use in an automobile or the like wherein the plunger and push switches are located to be accessible to the driver of the automobile and the alarm switch is located, for instance, to be activated upon undesired opening of a door. Relay means are included in the circuits such that, particularly in the circuit associated with the alarm switch, the signaling device will continue to sound even after the door is closed.

3,728,675

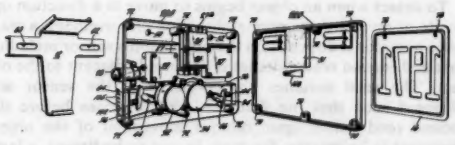
CYCLE ALARM APPARATUS

Raymond W. Horn, Moorestown, N.J., and Ignatius F. Bash, Huntingdon Valley, Pa., assignors to DVA Corporation, Mt. Laurel Township, N.J.

Filed May 17, 1971, Ser. No. 144,014

Int. Cl. B60r *25/10*

U.S. Cl. 340—65 **11 Claims**



Alarm apparatus suitable for attachment to a motor-cycle for producing an audible alarm when an unauthorized person tilts the cycle from the rest position in which it was left. The apparatus comprises a casing containing the alarm circuit and a self-contained power supply, the casing being mountable in a fixed angular position on the motorcycle, preferably at the rear of the cycle so that the license plate can then be mounted over the rear of the casing. The casing is held to the cycle by fastening means which are accessible only when a removable

portion of the casing is removed, and the alarm circuit is responsive to the removal of the closure portion of the casing to produce an electrical alarm signal when the closure portion is removed so that one cannot remove the entire casing or open the casing to disable it without sounding the alarm. The angle of the cycle is sensed by a pair of mercury switches within the casing, one for sensing tilt in one angular direction and the other for sensing tilt in the other direction from a reference angular position normally defined by the position in which the cycle is held by its stand. The two mercury switches are preferably independently adjustable in angular position so as to accommodate any stand angle. The battery within the casing energizes an alarm circuit whenever either one of the mercury switches is closed by tilting of the cycle or when the closure for the casing is removed, provideded also that a key-operated line switch has also been closed by the operator upon leaving the cycle. The alarm circuit includes a timing circuit such that when one of the switches has been closed and is then reopened, the alarm signal will continue for a predetermined length of time and will then terminate, thereby providing an adequate alarm in case of tampering with the cycle yet preventing continued operation of the alarm which will unduly deplete the battery supply.

3,728,676

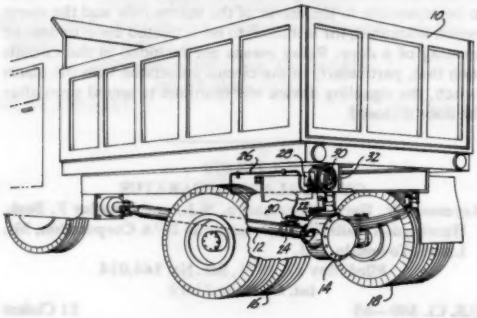
REVERSE MOTION DETECTOR

Robert A. Brown, Seattle, Wash., assignor to Electro Development Corporation, Lynwood, Wash.

Filed Dec. 2, 1970, Ser. No. 94,424

Int. Cl. B60q 5/00

U.S. Cl. 340—70 **8 Claims**



To detect when an object begins to move in a direction opposite or reverse to its normal direction of movement, a magnetic actuator is disposed on the object and a sensor including first and second reed switches is disclosed adjacent to the object. The reed switches are co-planar in the sensor and disposed such that the first reed switch closes before the second reed switch upon relative movement of the object therepast in its reverse direction. In one embodiment, a logic circuit provides an output signal if, and only if, the second reed switch closes in response to this actuator movement after the first reed switch closes and while the first reed switch remains closed. The output signal initiates operation of a timing circuit which provides a timing signal that inhibits further operation of the logic circuit and is applied through an audio oscillator to drive an amplifier and a loud speaker for a short time period. When the timing signal ceases, the logic circuit is automatically reset to detect subsequent reverse object movements. In a preferred embodiment, the apparatus is used as a vehicle back-up alarm in which the magnetic actuator is attached to the vehicle's drive shaft and the sensor is disposed in proximity thereto.

3,728,677

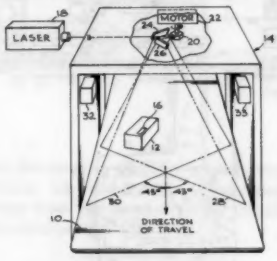
ROTATION-INDEPENDENT READING OF RECTANGULAR INSIGNIA

John H. Munson, Menlo Park, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed May 10, 1971, Ser. No. 141,717

Int. Cl. G06k 7/015, 5/00

U.S. Cl. 340—146.3 F **10 Claims**



A system is provided for scanning remotely encoded indicia, which may be in the form of a label on a package, and decoding same, regardless of the orientation, within wide limits of said indicia relative to a reader.

3,728,678

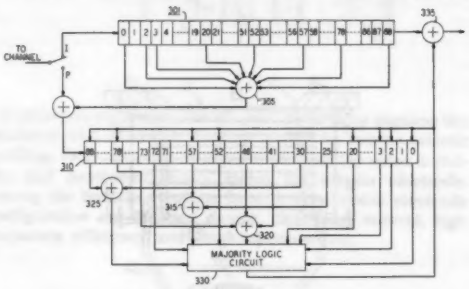
ERROR-CORRECTING SYSTEMS UTILIZING RATE ½ DIFFUSE CODES

Shih Yung Tong, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1971, Ser. No. 177,686

Int. Cl. G06f 11/12; G08c 25/00

U.S. Cl. 340—146.1 AQ **12 Claims**



Sequences of information bits, encoded in an orthogonalizable convolutional code of rate 1/2 and transmitted via a communication channel, are decoded to correct t random errors and bursts of B blocks where each block is 2 bits in length. The interconnections between an information bit shift register in the encoder and decoder and their respective parity check bit generating circuits and between a syndrome register and a majority logic circuit in the decoder are specified by relatively simple formulas which are functions of t and B.

3,728,679

SKEW DEVICE

Billy L. McIntosh, Houston, Tex., assignor to Weston Instruments Inc., Newark, N.J.

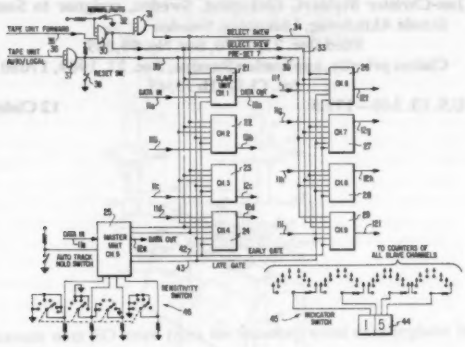
Filed Oct. 21, 1971, Ser. No. 191,324

Int. Cl. G06k 5/04

U.S. Cl. 340—146.1 F **10 Claims**

A device for correcting the time relationship of parallel data bits to eliminate the effect of certain forms of static skew. The apparatus accepts the data bits on parallel channels, one of

which is arbitrarily designated as the "master channel," the others being slave channels. Logic associated with the master channel generates an early gate signal upon arrival of a master channel data bit, and a late gate signal is generated, also as a result of the data bit arrival. An interval between the early gate and the late gate defines a "window" in time within which the apparatus produces a master channel data bit out, delayed by a predetermined amount, and within which the slave channel data bits should occur. If the slave channel data bits do not occur within this window, delay means in each slave channel is altered to readjust the occurence of the data bit out. Each slave channel is adjusted individually in accordance with the gate signal so that, after cyclic adjustment, the data bits are in essential coincidence. The interval between the early and late gate is adjustable by a sensitivity control to determine the accuracy of coincidence desired.



3,728,680

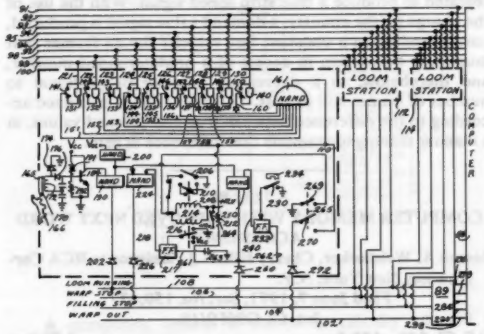
LOOM STOP DATA COLLECTION SYSTEM

Littleton Upshur, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 746,962, July 23, 1968, abandoned. This application March 30, 1970, Ser. No. 23,943

Int. Cl. H04q 9/00

U.S. Cl. 340—147 R **24 Claims**



The invention relates to a system for conveying information from a plurality of stations, particularly stations associated with textile machines such as looms, to a recorder such as a human operator or a computer. A plurality of address lines connect each textile machine station to each other textile machine station and carry coded address signals, each address line carrying a digit of a binary number representing the particular station chosen for interrogation, and at least a single return line connects each station to each other station and to the recorder to convey information gathered at the station to the recorder. In one embodiment, address signals designating a particular loom station are sent by an interrogator to each loom and the loom so chosen by the address signals responds by applying electrical information signals containing information on the condition of the chosen loom to the return line or lines. The information signals on the return line or lines are sequentially examined and the interrogation ended if certain information is present.

3,728,681

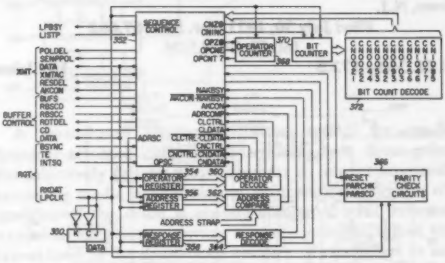
DATA LOOP COMMUNICATION PRIORITY ESTABLISHING APPARATUS

Ray C. Fuller, Cedar Rapids; Gary D. Phillips, and Richard B. Simone, both of Marion, all of Iowa, assignors to Collins Radio Company, Dallas, Tex.

Filed Jan. 6, 1972, Ser. No. 215,808

Int. Cl. H04q 5/00

U.S. Cl. 340—147 R **7 Claims**



The method of configuring communication units, all of which are connected in series on a loop such that some units may take priority and communicate out of the logical sequential order. This is accomplished using a master unit and first and second sets of slave units. The slave units respond to poll requests. These polls may come either from the master or the previously responding slave unit. The master unit always sends a prepoll before a poll. The first set of slave units will respond to a prepoll or a poll and thus can take priority in transmitting messages. The second set of slaves will respond only to a poll, internally set a flag, and then transmit a poll to further slave units upon receipt of the next prepoll.

3,728,682

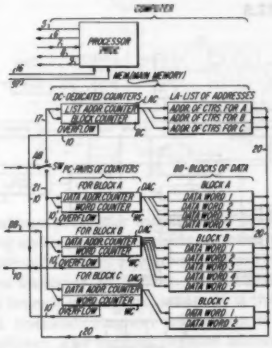
COMPUTER INPUT-OUTPUT CHAINING SYSTEM

Walter Allen Helbig, Sr., Medford Lakes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed March 11, 1971, Ser. No. 123,281

Int. Cl. G06f 3/00

U.S. Cl. 340—172.5 **15 Claims**



A computer input-output (I/O) system is disclosed which is particularly useful in the performance of text editing functions

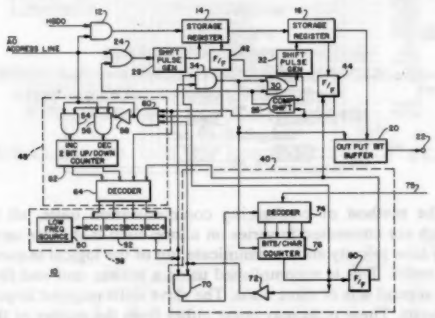
and the like, wherein it is desired to transfer scattered units or blocks of information in a particular desired order between a processor main memory and at least one I/O controller connected with an I/O device. A data word counter is provided in memory for the sequential addressing of the data words in each block of data. The addresses of the data word counters are stored in memory as a list of addresses in the order in which the blocks of data are to be transferred. A dedicated counter location is provided in memory for the sequential addressing of the list of addresses. The I/O controller is constructed to initially address the dedicated counter location in the memory and to cooperate with the processor in performing a sequence of steps which results in a transfer of all of the desired data in the desired sequence.

3,728,683

APPARATUS FOR CONTROLLING OUTPUT DATA RATE

Karl E. Biegert, Moorestown, and Robert M. Tice, Glassboro, both of N.J., assignors to Ultronic Systems Corp., Moorestown, N.J.

Filed July 30, 1971, Ser. No. 167,662
Int. Cl. G06f 5/06
U.S. Cl. 340—172.5 **14 Claims**



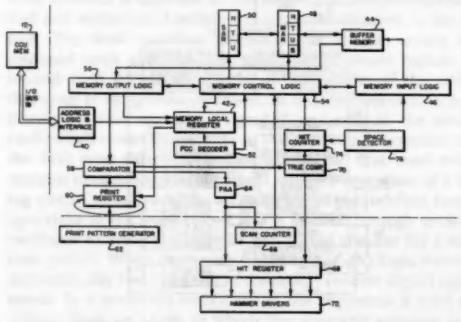
Apparatus for controlling the output data rate in a time division multiplexing system (TDM) for generating data including a stop bit employs a means for automatically sensing a buildup of input data in an input buffer and a means for automatically adjusting the time interval of the stop bit inversely with the data buildup in the buffer.

3,728,684

DYNAMIC SCANNING ALGORITHM FOR A BUFFERED PRINTER

Victor M. Morganti, Arlington, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 5, 1970, Ser. No. 61,204
Int. Cl. G06f 3/12
U.S. Cl. 340—172.5 **12 Claims**



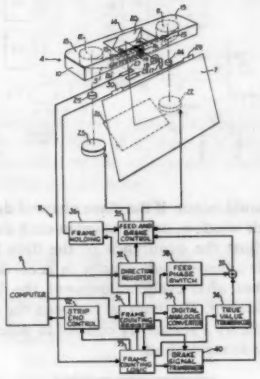
A buffered line printer adapter capable of accepting multiple lines of data and control characters from a central processor memory, and dynamically expanding the data during a print scan cycle, by means of a hardware algorithm which operates on the control characters contained in the buffer memory.

3,728,685

RAPID ACCESS TO A SELECTED SEGMENT OF A STRIP INFORMATION CARRIER

Jan-Christer Stalnert, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Dec. 21, 1970, Ser. No. 99,849
Claims priority, application Sweden, Dec. 22, 1969, 17680
Int. Cl. G11b 15/48
U.S. Cl. 340—172.5 **12 Claims**



For lengthwise transit of a film strip from one frame at a fixed station, to bring any other selected frame thereto, a counter is charged with the initial number of frames that must pass the station. A pulse is produced as each frame passes the station, to count down the counter. The pulses are also integrated to produce a true strip speed signal. With the use of the charge on the counter, a demand value signal is produced, corresponding to a constant fast velocity for all frames that must pass the station in excess of a predetermined number, and therebelow, to a decreasing velocity proportional to number of frames still to pass. The strip drive is energized according to the difference between true and demand values, in a manner tending to maintain that difference at zero.

3,728,686

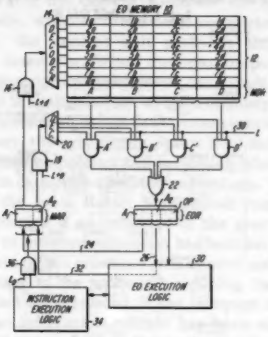
COMPUTER MEMORY WITH IMPROVED NEXT WORD ACCESSING

Joseph A. Weisbecker, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 7, 1971, Ser. No. 150,437
Int. Cl. G06f 9/16
U.S. Cl. 340—172.5 **2 Claims**

A computer elementary operation (EO) control memory has memory word storage locations each containing a plurality of EO words. Each EO word contains an operation code, memory word address bits of a next memory word to be accessed, and information identifying a particular EO word in the next memory word. Each EO word which contains a conditional branch operation code includes information identifying an alternate EO word in the next memory word, to be utilized in dependence on a machine condition then existing. The memory word address bits in an EO register are used to read a next memory word from the memory to a memory word data register. Concurrently therewith, the operation code present

in the EO register is decoded and used to test a machine condition, and thereafter transfer the selected original or al-



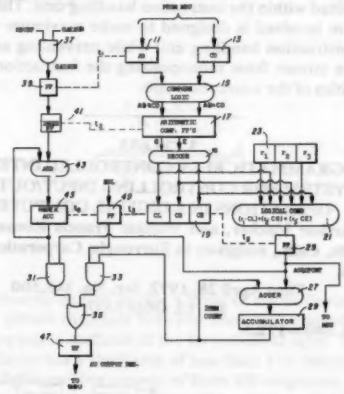
ternate next EO word from the memory word data register to the EO register.

3,728,687

VECTOR COMPARE COMPUTING SYSTEM

William J. Watson, and William D. Kastner, both of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1971, Ser. No. 103,540
Int. Cl. G06f 7/00
U.S. Cl. 340—172.5 **4 Claims**



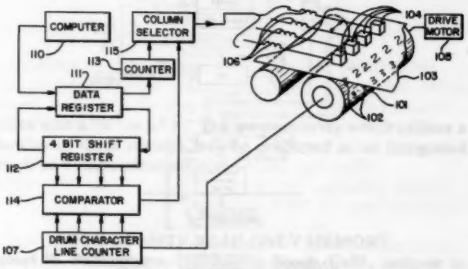
A computing system is shown specifically adapted for processing vectors. Two vector streams, each vector stream having an ordered array of elements, are compared and the relationship between the elements in the two vector streams are determined. The computing system may determine when specific elements of the two vector traces are equal to each other, when an element in the first is greater than an element in the second, when an element in the first is greater than or equal to an element in the second, when an element in the first is less than an element in the second, when an element in the first is less than or equal to an element in the second, when an element in the first is unequal to an element in the second and when for each element in vector trace A there is a corresponding element in vector trace B.

3,728,688

LINE PRINTER TIME SHARED ELECTRONICS

Richard F. Elmhurst, Largo; John S. Farina; David C. Davis, Jr., both of Clearwater, and William A. Elmhurst, Largo, all of Fla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed May 24, 1971, Ser. No. 146,215
Int. Cl. G06f 3/12
U.S. Cl. 340—172.5 **19 Claims**



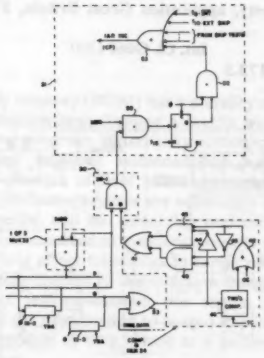
A time-shared electronic control system for use with hammer-actuated continuously rotating-type drum-printers, for selectively driving print hammers to impact intermediate recording media upon the drum. Information indicative of the position of the drum is serially compared with information available for printing during a print-cycle equivalent to the travel-time of the drum from one row of characters to an adjacent row, and upon attaining correspondence of information, emitting and storing an electronic signal indicative of the column for printing during that print-cycle.

3,728,689

PROGRAM BRANCHING AND REGISTER ADDRESSING PROCEDURES AND APPARATUS

Howard W. Edwards, Jr., Dracut, Mass., assignor to Sanders Associates Inc., Nashua, N.H.

Filed June 21, 1971, Ser. No. 155,068
Int. Cl. G06f 9/20
U.S. Cl. 340—172.5 **9 Claims**

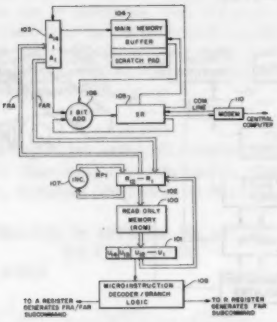


A serial buss processor with detailed description of program branching and register addressing. A mask and branch instruction is utilized to effect a relative program branch of up to $N+1$ address locations away from the address of the current or masking branch instruction, where N is the number of bits in the data operand. Register addressing is partly direct and partly indirect. The indirect register address scheme employs a directly addressable register, the contents of which are interpreted by an indirect address generator unit which itself is directly addressable such that a single value in the directly addressable register may be used to point to different registers.

3,728,690
BRANCH FACILITY DIAGNOSTICS

Thomas O. Holtey, Newton Lower Falls, and Donald J. Greenwald, Brookline, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Aug. 26, 1971, Ser. No. 175,266
Int. Cl. G06f 11/04
U.S. Cl. 340—172.5 21 Claims

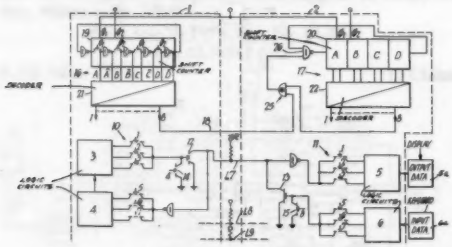


Diagnostic hardware and a method for diagnosis and confidence testing of ROM branching capabilities. Logical circuitry including an RIT flip-flop, which when set modifies the operation of a halt "HLT" micro-op which normally stops the clock, so that the halt "HLT" micro-op will not stop the clock and its absence or the presence of any other micro-op will stop the clock. Execution of any of a predetermined set of branch micro-instructions to predetermined memory locations, sets the RIT flip-flop and causes a branch to a location containing a "HLT." If branching operates properly, the program continues; if not the machine halts, thus identifying the error and avoiding loss of control of the machine.

3,728,691
INTEGRATED CIRCUITS FOR MULTIPLEXING

George Earley Stevenson, 15, Townsend Crescent, Kircaldy, Scotland

Filed June 3, 1971, Ser. No. 149,455
Claims priority, application Great Britain, Feb. 9, 1970, 6,166/70
Int. Cl. G06f 1/00
U.S. Cl. 340—172.5 25 Claims

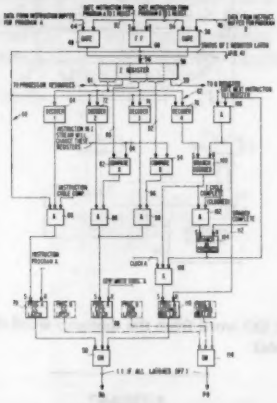


Integrated circuits comprising arrays of digital logic elements interconnected amongst the circuits by data transmission conductors which are fewer in number than the digital data channels of the arrays, the digital data channels being connected to the data transmission conductors by semiconductor switching elements which are so switched as to produce a multiplexed transmission of digital data between the channels and conductors, the switching of the switching elements of the circuits being synchronised by one of said data transmission conductors or a further conductor.

3,728,692
INSTRUCTION SELECTION IN A TWO-PROGRAM COUNTER INSTRUCTION UNIT

John Wenard Fennel, Jr., Beltsville, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1971, Ser. No. 176,494
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 5 Claims

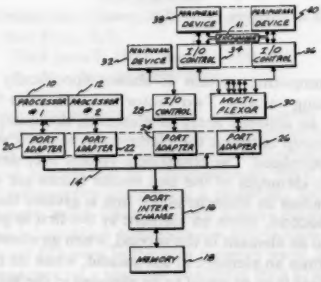


In an instruction handling unit specifically designed for pipeline processing of instructions an apparatus is disclosed which allows the instruction handling unit to process simultaneously computer instructions from two different programs. The apparatus employed for sharing the instruction unit processing capabilities among two programs performs certain checks upon the specific instructions of the two different instruction streams and determines from various machine conditions and variable program conditions which instruction will be executed within the instruction handling unit. The selection algorithm involved is designed to make maximum utilization of the instruction handling unit while preventing any one instruction stream from monopolizing the instruction handling capabilities of the instruction unit.

3,728,693
PROGRAMMATICALLY CONTROLLED INTERRUPT SYSTEM FOR CONTROLLING INPUT/OUTPUT OPERATIONS IN A DIGITAL COMPUTER

John Arthur Macker, and William Francis Keenan, both of Goleta, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed April 28, 1972, Ser. No. 248,500
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 23 Claims



A digital computer system in which each input/output operation for transferring data between main memory and any

one of a plurality of peripheral devices is initiated by a processor executing a Dispatch operation through an exchange associated with the main memory. In response to a Dispatch operation a designated input/output control unit examines a Result Status field of an associated input/output descriptor stored in main memory. The Result Status field defined by the descriptor indicates the current status of the input/output operation, namely, whether it has been completed or not. If not completed, the control unit performs the operation defined by the descriptor. When the input/output operation defined by the descriptor is completed, the Result Status field of the descriptor is again read out of main memory to the control unit and a new Result Status field written into the same location in memory, the new Result Status field indicating the operation has been completed and indicating whether or not there has been an exception condition, errors, etc. The control unit examines the prior Result Status field received from memory to determine if an interrupt of the processor is indicated. Only if an interrupt condition has been set in the prior Result Status field by the processor, the control unit initiates a Dispatch operation to the processor, signaling the processor that the operation is completed. If the interrupt condition is not set or if the interrupt condition has been set after the Dispatch operation is initiated, the control unit reads out a link address from the descriptor, and using the link address, reads out the Result Status field of another descriptor from memory. If the Result Status field of a descriptor, when first examined, indicates that the input/output descriptor has already been completed, the control unit continues to inspect the Result Status field at timed intervals until the Operation Complete condition is reset, in which case the input/output descriptor operation is again executed by the control unit.

3,728,694

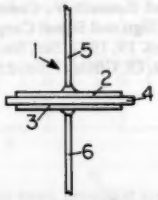
THIN FILM FERROELECTRIC DEVICE

George Andrew Rohrer, Dallas, Tex., assignor to Technovation, Inc., Grosse Ile, Mich.

Filed Sept. 28, 1970, Ser. No. 76,059

Int. Cl. G11c *11/22*

U.S. Cl. 340—173.2 **5 Claims**



A ferroelectric device having a layer of stable ferroelectric potassium nitrate disposed between electrical contacts positioned on opposite surfaces of the ferroelectric layer. The ferroelectric layer has a thickness of less than 110 microns, and preferably falling within a range of from 100 angstrom units to 1000 angstrom units. The process of manufacturing the ferroelectric device includes the cooling of a layer of potassium nitrate by exposing the layer to a cold dry gas without quenching to form a stable ferroelectric layer.

3,728,695

RANDOM-ACCESS FLOATING GATE MOS MEMORY ARRAY

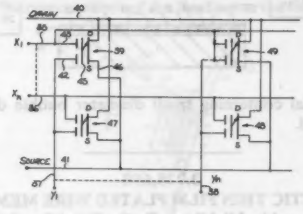
Dov Frohman-Bentchkowsky, Los Altos, Calif., assignor to Intel Corporation, Mountain View, Calif.

Filed Oct. 6, 1971, Ser. No. 186,995

Int. Cl. G11c *11/40*; H01l *11/00, 15/00*

U.S. Cl. 340—173 R **18 Claims**

A random-access memory array which utilizes a metal-oxide-semiconductor MOS device as a storage element is disclosed. The device includes a floating gate which may be selectively charged and discharged in order to program the device with a "0" or a "1." The memory array which utilizes a plurality of these devices may be produced as an integrated circuit on a single substrate.



3,728,696

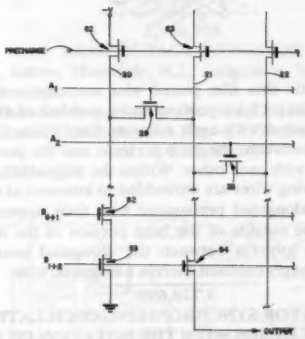
HIGH DENSITY READ-ONLY MEMORY

Robert W. Polkinghorn, Huntington Beach, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Dec. 23, 1971, Ser. No. 211,311

Int. Cl. G11c *17/00, 11/40*

U.S. Cl. 340—173 SP **6 Claims**



A read-only memory (ROM) has a plurality of address input lines and selection lines forming a matrix with regions of a semiconductor substrate. Binary information is stored at locations between adjacent semiconductor regions by the presence or absence of field effect transistors thereat. Alternate semiconductor regions are selectively connected to a voltage reference, and the remaining regions there-between are selectively connected to a common output point by means of selection field effect transistors in series with each region. Selection signals applied to the selection transistors of an adjacent pair of regions connect one region to the voltage reference and the other region to output to provide an output signal as a function of data stored at a particular addressed storage location.

3,728,697

BUBBLE DOMAIN SYSTEM

David M. Heinz, Orange, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

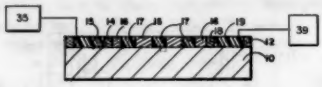
Filed Dec. 21, 1970, Ser. No. 99,937

Int. Cl. G11c *11/14*

U.S. Cl. 340—174 TF **7 Claims**

A bubble domain system of magnetic material having a portion containing small diameter bubble domains and an ad-

jacent portion having larger diameter bubble domains. A method for forming large diameter bubble domains in a magnetic material containing small diameter bubble domains is also included.



3,728,698

MAGNETIC THIN FILM PLATED WIRE MEMORY

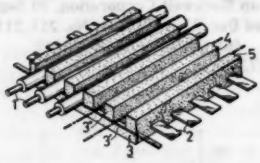
Seihin Kobayashi; Michihiro Torii; Takehiko Jojima, and Masanao Okuda, all of Hamana-gun, Shizuoka-ken, Japan, assignors to Fuji Denki Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1971, Ser. No. 174,358

Claims priority, application Japan, Aug. 29, 1970, 45/86434; Sept. 29, 1970, 45/96590

Int. Cl. G11c *11/14, 11/04*

U.S. Cl. 340—174 BC **6 Claims**



In a magnetic thin film plated wire memory, a magnetic keeper comprises a base portion and a number of elongated protrusions spaced with each other at fixed spaces to form grooves therebetween, the base portions and the protrusions being integral with each other. Within the magnetic keeper, a number of driving wires are embedded to intersect at right angles with the elongated protrusions with their upper surface exposing to the outside of the base portion of the magnetic keeper at the grooves between the elongated protrusions. Each groove snugly contains therein a magnetic wire.

3,728,699

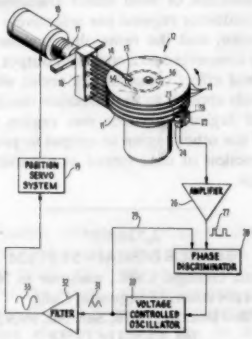
APPARATUS FOR SYNCHRONIZING OSCILLATION OF READ/WRITE HEADS WITH THE ROTATION OF A DATA STORAGE DISC PACK

Frank J. Sordello, San Jose, Calif., assignor to Information Storage System, Inc., Cupertino, Calif.

Filed Aug. 16, 1971, Ser. No. 172,141

Int. Cl. G11b *5/00*

U.S. Cl. 340—174.1 C **6 Claims**



Apparatus is described for oscillating the read/write head carriage of a rotary drive mechanism for data storage disc pack. An optical sensing device is employed to determine the angular phase and frequency of rotation of the disc pack, and a phase discriminator compares the sensed frequency with the output of an oscillator to phase-lock the oscillator thereto. The resulting oscillation signal is fed to an electromagnetic actuator to cause oscillation of the read/write head in synchronism with the rotation of the disc pack.

3,728,700

ALARM MEANS FOR COBALT THERAPY MACHINE

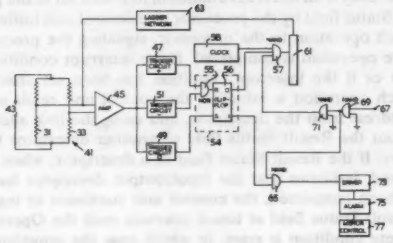
Francois Duval, Lucerne, Quebec, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Feb. 17, 1970, Ser. No. 12,019

Claims priority, application Canada, May 21, 1969, 052049

Int. Cl. G08b *21/00*

U.S. Cl. 340—181 **7 Claims**



An alarm means on a cobalt therapy machine of the type in which the patient rests on a stretcher and a moving rotating head of a cobalt irradiation device moves relative to the stretcher. Transducers measure changes in the forces on the stretcher, and so provide an alarm upon any interference between the moving parts and the stretcher by measuring the difference between an output signal and a reference signal.

3,728,701

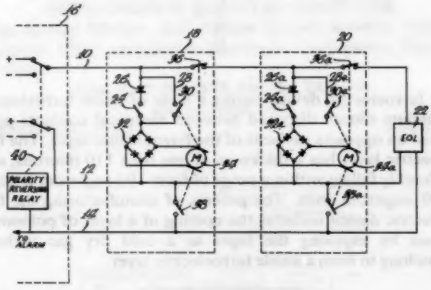
POSITIVE NON-INTERFERING TRANSMITTER

Joe D. Reynolds, and Kenneth V. Cannon, Shelby, Ohio, assignors to Federal Sign and Signal Corporation, Chicago, Ill.

Filed Oct. 19, 1971, Ser. No. 190,543

Int. Cl. G08b *17/06, 25/00*

U.S. Cl. 340—217 **8 Claims**



A plurality of transmitters utilizing common wiring are connected to a control unit having a power reversal relay. The transmitters each incorporate a diode and a rectifier protected motor that activates a coded signal on a separate signal line. Activation of any one of the transmitters causes a reversal of polarity and shunts the diode therein, thereby allowing operation of the one transmitter while power is blocked from the other transmitters until the complete signal has been transmitted.

3,728,702

TEMPERATURE ALARM UTILIZING PAIRED POSITIVE AND NEGATIVE COEFFICIENT THERMISTORS

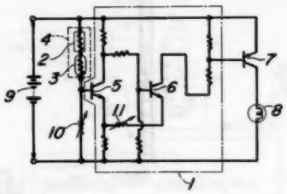
Mamoru Miyamoto, Neyagawa, and Minoru Takaichi, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Dec. 7, 1970, Ser. No. 95,635

Claims priority, application Japan, Dec. 11, 1969, 44/118195

Int. Cl. G08b 21/00

U.S. Cl. 340—228 R 1 Claim



An engine temperature warning device which detects the temperature of an engine by means of a thermosensitive element comprising the combination of a negative characteristic thermistor and a positive characteristic thermistor which are thermosensitive semiconductor resistors to operate a contactless electronic solid state switching circuit to energize and deenergize a warning lamp.

3,728,703

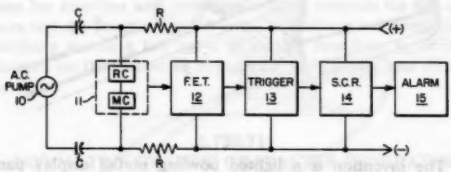
FIRE DETECTOR STABILIZER CIRCUIT

James H. Burnett, Wilton, Conn., assignor to Edward Company, Inc., Norwalk, Conn.

Filed Oct. 12, 1970, Ser. No. 79,972

Int. Cl. G08b 17/10; H01j 39/28

U.S. Cl. 340—237 S 9 Claims



A fire detector has been provided including an ionization sensing means which changes the level of an output signal in accordance with the sensing of the presence of smoke particles in the atmosphere. A detecting means including a semiconductor device selectively responds to the output signal and generates an alarm control signal. The improvement includes a very high frequency pump source coupled across the sensing and detecting means for stabilizing the ionization and to quench areas of intense ionization within the sensing means and the semi-conductor.

3,728,704

AUTOMATIC TRANSMISSION FLUID LEVEL INDICATOR

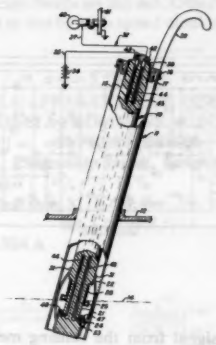
Thomas Moore, 3440 Kenyon Avenue, Baltimore, Md.

Filed April 19, 1971, Ser. No. 134,981

Int. Cl. G08b 23/00

U.S. Cl. 340—244 A 9 Claims

An automatic transmission fluid level indicator having a removable rod with an area of reduced diameter at and extending below the desired fluid level, a float including a conductive ring surrounding the reduced area, a circuit received in the rod connects a battery with a lamp or other indicator through the conductive ring upon sufficient descent of the float to indicate a significant decline in the fluid level. The float with the conductive ring is urged downwardly by a compression spring which, however, is insufficient in force to overcome the buoyance effect of the fluid upon the float, but when



the rod is drawn out of the fluid, the circuit is automatically closed. A plug on top of the shaft provides for removal of the rod from the circuit. The amount of extension of the rod into the automatic transmission casing is adjustable whereby the amount of fluid loss to energize the indicator is also adjustable.

3,728,705

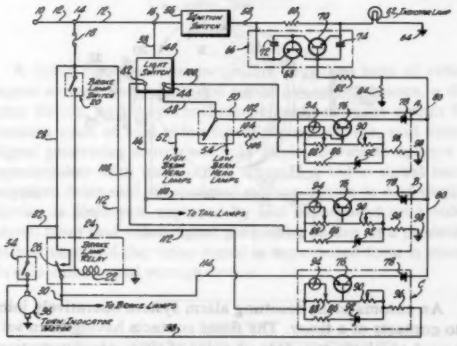
LAMP OUTAGE INDICATOR

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation

Continuation-in-part of Ser. No. 591,529, Dec. 12, 1966, abandoned. This application May 4, 1970, Ser. No. 34,497

Int. Cl. G08b 21/00

U.S. Cl. 340—251 8 Claims



A monitoring circuit wherein a change in the electrical load in an automobile lamp circuit causes the output of a sensing amplifier to increase and actuate a control switch that lights an indicator to show the change in load.

3,728,706

SYSTEM FOR INDICATING AEROSOLS IN THE ATMOSPHERE

William C. Tipton, Newark, and Michael Suchomel, Mountainside, both of N.J., assignors to General Signal Corporation, Rochester, N.Y.

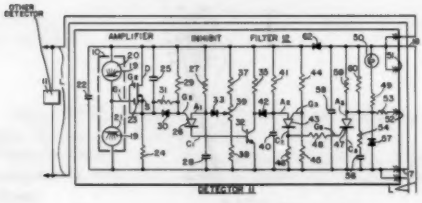
Filed Sept. 28, 1970, Ser. No. 76,149

Int. Cl. G08b 17/10; H01j 39/28

U.S. Cl. 340—237 S 15 Claims

A fire detector having an ionization sensing means which changes the level of an output signal in accordance with

sensing the presence of smoke in the atmosphere has been provided. A detecting means selectively responsive to the output signal generates an alarm control signal and the improvement includes a filter means for rendering a detecting means operable if uninhibited to generate the alarm signal irrespective of an output signal from the sensing means. Inhibiting means normally operable to inhibit the filter is rendered ineffective in response to the output signal of the sensing means and the inhibiting means therefore checks the operability of the detecting means.



3,728,707

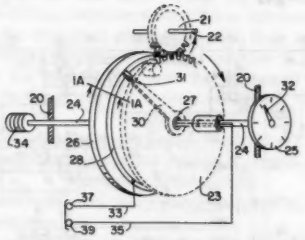
AUTOMATIC ALARM SETTING SYSTEM

Siegfried Herrnreiter, 2840 West Montrose, Chicago, Ill.

Filed May 10, 1971, Ser. No. 141,803

Int. Cl. H01h *43/10*

U.S. Cl. 340—309.1 **8 Claims**



An automatically resetting alarm system operatively joined to contacts of a timer. The timer contacts having been set to sound an alarm at a desired point of time, are automatically reset after the alarm for sounding the next alarm.

3,728,708

ILLUMINATED MARKER

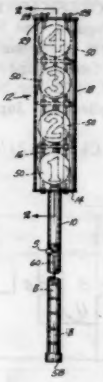
Fred J. Culbertson, Route 1, P. O. Box 225, Concrete, Wash.

Filed June 21, 1971, Ser. No. 155,021

Int. Cl. A63b *71/06*

U.S. Cl. 340—323 **10 Claims**

A vertical tier of lights are supported by brackets on a pair of elongated connector rods. Intermediate walls are located vertically between the lights and are supported by the connector rods. The lower ends of the connector rods are attached to a base plate which serves as a base support for a transparent plastic tubular body. The intermediate walls are snugly received within the body. The connector rods project upwardly through openings in a cover plate which rests on the upper end of the body. Wing nuts or the like are threaded onto the connector rods and used for securing the assembly together. The lights carry separate indicia and are separately controlled by a multi-position switch.



3,728,709

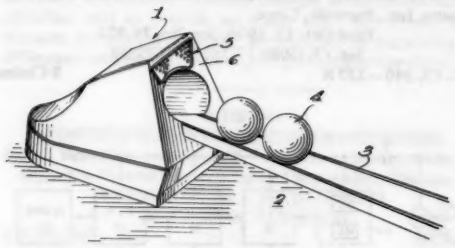
PIN FALL DISPLAY ON BALL LIFT HOOD

David Peter McLeod, and Patrick J. Murphy, both of Muskegon, Mich., assignors to The Brunswick Corporation, Skokie, Ill.

Filed July 12, 1971, Ser. No. 161,700

Int. Cl. G08b *5/36*

U.S. Cl. 340—323 **9 Claims**



The invention is a lighted bowling pinfall display panel located on the face of a ball return lift hood for indicating to a bowler through the means of a light pattern which bowling pins remain standing after a ball has been delivered. Indicator lights arranged to simulate pin spots are powered by a low voltage DC source mounted beneath the lift hood. Solid state circuitry mounted adjacent the indicator light brackets controls the lighting of the panel lamps and is actuated by pin detection means associated with an automatic pinsetter, or by pinfall signals from an automatic scorer.

3,728,710

CHARACTER DISPLAY TERMINAL

Nephi Edward Berg, Bedford, N.H., assignor to Hendrix Wire & Cable Corp., Milford, N.H.

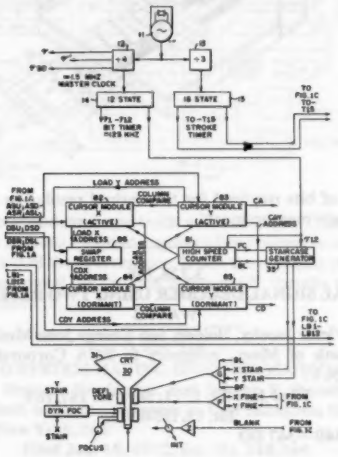
Continuation-in-part of Ser. Nos. 587,583, Oct. 18, 1966, and Ser. No. 835,591, June 23, 1969. This application Dec. 1, 1969, Ser. No. 881,105

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **22 Claims**

A synchronous refresh memory CRT Display Terminal continuously generates the individual deflection waveforms for the complete repetoire of characters and symbols which it is desired to display. The recirculating memory provides storage for the identity code and editing tags for each character posi-

tion on the CRT display and recirculation in the memory loop is synchronized with a character by character beam deflection of the CRT to provide a page format indication. Provision is made for reading into the memory loop the character identity code at a preselected position corresponding to the screen character location at which the character is to be displayed and once in memory the refresh rate will continually display the character sequence in the memory loop in the corresponding sequence of character positions on the screen format with only the code address for each character being read from



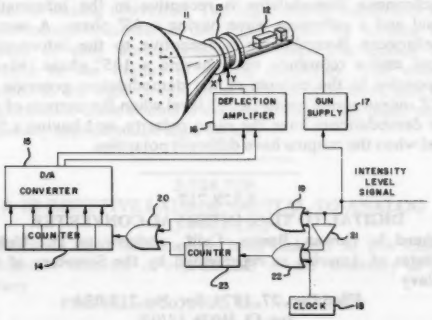
memory and upon decoding selecting from the repetoire character generator each so identified character for display by the continuously generated fine waveform deflection signals. An active and dormant cursor are presented on the screen generated in the same manner as any character or symbol but controllable as to position at will to identify the screen location for insertion and deletions. Editing controls for the cursors and the insertion and deletion operations independent of memory permit a full range of editing functions to be performed on the character content of the memory and display screen.

3,728,711

DOT MATRIX GRAPHIC CHARACTER GENERATOR

William J. Adkins, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed July 16, 1970, Ser. No. 55,474
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 AD **4 Claims**



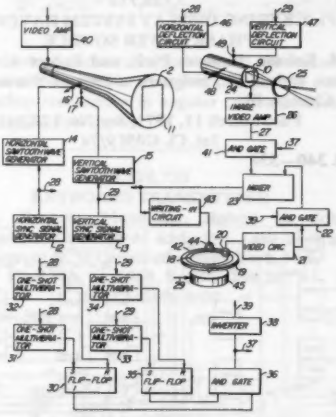
In a dot matrix type character generator for displaying graphic information the cathode ray beam dwells on a dot location only if that dot is intensified. The matrix generator has a plurality of dot locations on a phosphor screen which are selectively energized by a cathode ray beam. The intensity of the beam is modulated with an on-off intensity level signal. The beam indexes from dot to dot in a fixed pattern. Logic circuitry senses when a dot is to be intensified by the beam. In this case the beam dwells on the dot. Otherwise the beam is indexed from dot to dot by high speed clock pulses.

3,728,712

VIDEO FILE APPARATUS FOR DISPLAYING AND STORING DATA FROM PLURAL DOCUMENTS IN SUPERPOSITION

Hiroshi Nagai, Chigasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1970, Ser. No. 103,071
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **4 Claims**



A video file apparatus includes a recycling type of video-signal storage device, a video-signal generating source, a display device, and a synchronizing-signal generator circuit for causing each of said video-signal storage device, said video-signal generating source and said display device to operate in synchronism with each other, wherein a video signal being supplied from said video-signal storage device to said display device is displayed, replaced by and superposed on a video signal from said video-signal generating source at a predetermined time and the video signal in superposed form is stored in said video-signal storage device.

3,728,713

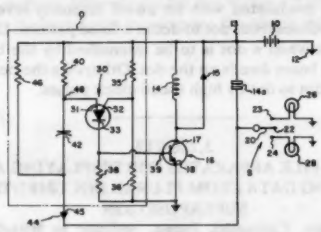
TRANSISTORIZED FLASHER CIRCUIT

Ralph W. Alten, East Detroit, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed July 28, 1970, Ser. No. 58,919
Int. Cl. B60q *1/38*; H05b *39/09*
U.S. Cl. 340—331 **2 Claims**

A transistorized flasher circuit for vehicle signal lamps comprising a free running multivibrator, incorporating a capacitor and a programmable unijunction transistor, for cyclically and intermittently driving an output transistor into a conductive state as the capacitor is alternately charged and discharged. A relay is provided and includes a coil connected in series with the output circuit of the output transistor and a set of normally open contacts which are connected in series with a lamp load and a start switch and which are closed in response to the energization of the coil. A charging circuit including the capacitor and a diode connected in series therewith is connected in parallel with the set of relay contacts for charging

the capacitor along a first path when the set of relays contacts open. A discharging circuit is provided for discharging the capacitor along a second path, which does not include the diode, when the relay contacts close.

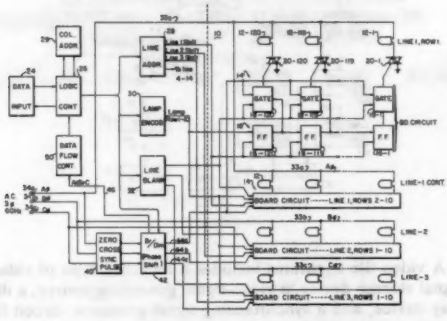


3,728,714

NON-FLICKERING DISPLAY SYSTEM HAVING MULTI-PHASE POWER SOURCE

Paul M. Kolesar, Hanover Park, and Robert A. Payne, Des Plaines, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed March 11, 1971, Ser. No. 123,341
Int. Cl. G09f 9/34
U.S. Cl. 340—334 **4 Claims**



A display system for showing display frames in rapid sequence to form an animated portrayal or the like. A multi-phase alternating-current power source is employed to energize a display board which has a matrix of electric lamps arranged in separate groups each associated with one of said alternating-current power phases. A triac is associated with each lamp to connect the lamp to said power source. The triacs are appropriately gated to energize the individual lamps of the matrix as required by the input information.

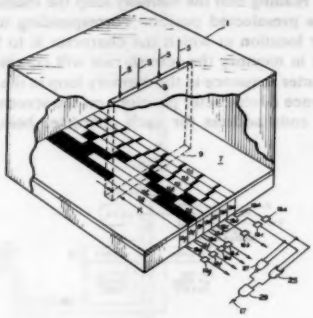
3,728,715

DIGITAL SUN SENSOR HAVING SUB-IMAGE RESOLUTION

William A. Shapiro, Hackensack, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed April 20, 1970, Ser. No. 29,819
Int. Cl. G08c 9/06
U.S. Cl. 340—347 P **28 Claims**

A sun sensor having an aperture for receiving sunlight and forming an image of the aperture on an encoder mask, the position of the image corresponding to the angle of the sun relative to the sensor. The mask has a plurality of tracks having alternate opaque and clear segments for passing sunlight to associated photo cells which provide in response thereto a coded digital output corresponding to the image position and having sub-image resolution, that is, resolution smaller than the image. Circuit means combines certain bits of the coded output to provide a Gray Code output having the minimum number of bits required for the desired resolution and maximum angle measurement.

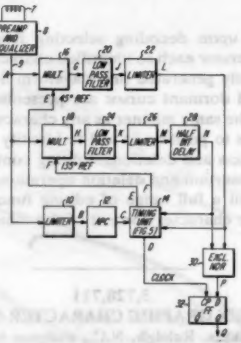


3,728,716

DIGITAL SIGNAL DECODER USING TWO REFERENCE WAVES

George Victor Jacoby, Holden, and George John Meslener, Acton, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed July 29, 1971, Ser. No. 167,169
Int. Cl. H04l 3/00
U.S. Cl. 340—347 DD **9 Claims**



A decoder is described for a magnetically recorded information signal in which a transition occurs at the center of a bit cell containing a "1," and a transition may occur at the boundary between two successive bit cells containing "0"s. A first synchronous demodulator is receptive to the information signal and a reference wave having a 45° phase. A second synchronous demodulator is receptive to the information signal and a reference wave having a 135° phase. Means responsive to the outputs of the demodulators generate an NRZ output signal having a "1" level when the outputs of the two demodulators have the same polarity, and having a "0" level when the outputs have different polarities.

3,728,717

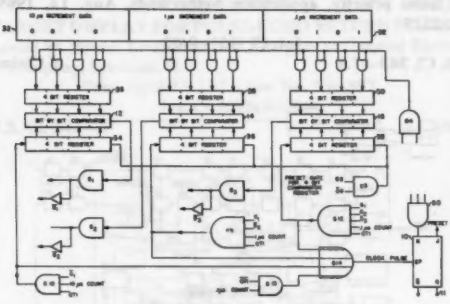
DIGITAL TO TIME INTERVAL CONVERTER

Richard L. Gowan, Bonita, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 27, 1971, Ser. No. 212,084
Int. Cl. H03k 13/02
U.S. Cl. 340—347 DA **6 Claims**

A device for producing a range of precisely known pulse widths by digital decoding. A coded signal representative of

the duration of a desired pulse is stored in a register and its leading edge is used to turn on a flip-flop. A stable high frequency pulse source supplies the input to a counter which provides output pulses representative of ten microseconds,



one microsecond, and one tenth microseconds. These output pulses are fed into a second register whose output is compared to the output of the first register. When the contents of the two registers are equal the flip-flop is turned off, thereby terminating the pulse.

3,728,718

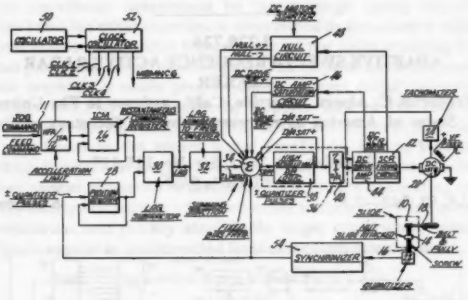
SERVO SYSTEM HAVING HIGH RESOLUTION D/A

Allan W. Dresser, Newington, and Johann F. Reuteler, Elmwood, both of Conn., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Jan. 18, 1972, Ser. No. 218,745

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 DA **4 Claims**



A numerical control system for moving a controlled member along a given axis includes a digital to analog converter and a logic circuit to increase the resolution of the digital to analog converter. The logic circuit subdivides adjacent counts retained in the logic circuit by varying the amount of time during which the respective counts are directed to the digital to analog converter. The counts retained in the logic circuit differ by a fixed amount, and the magnitude of these counts is dependent upon the input pulse frequency applied to the logic circuit.

3,728,719

R-2R RESISTIVE LADDER, DIGITAL-TO-ANALOG CONVERTER

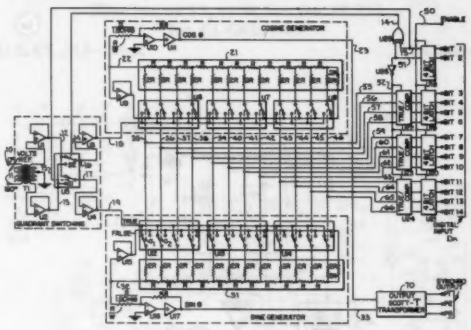
Franklin H. Fish, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 20, 1972, Ser. No. 236,418

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 DA **8 Claims**

A digital-to-analog converter having digital angular data inputs applied to integrated switches to cause predetermined switching in circuit with resistance ladder networks of R and 2R values providing sine and cosine approximation analog voltage functions representing the digital input signals some of which digital signals control quadrant switches to produce



quadrant reference phase relationships and the remainder of such control analog signals to provide amplitude scaling to drive a synchro mechanism in angular correspondence with the digital angular data inputs.

3,728,720

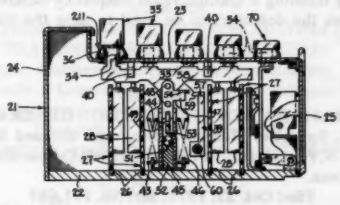
KEYBOARD TRANSMITTER

Charles R. Kovacic, Mundelein; Robert M. Schildgen, Northbrook, and Hilding A. Anderson, Lake Zurich, all of Ill., assignors to SCM Corporation, New York, N.Y.

Filed Feb. 14, 1969, Ser. No. 799,287

Int. Cl. G08c *9/08*

U.S. Cl. 340—365 **2 Claims**



There is disclosed a keyboard transmitter having symbol keys, shift and shift-lock keys, a symbol key interlock for preventing more than one symbol key from being depressed at a time, a keyboard lock for locking up the keyboard, a weatherseal forming a seal between each key and the keyboard housing, a plurality of printed circuit boards extending transversely with respect to the symbol keys, a plurality of switches mounted by each printed circuit board, each symbol key being aligned with one of said switches, and code means mounted by each printed circuit board adjacent its respective switch.

3,728,721

DIFFERENTIAL DOPPLER DETECTION FOR RF INTRUDER ALARM SYSTEMS

Alex Y. Lee, Arlington, Va., and David N. Gershberg, Rockville, Md., assignors to The Mosler Safe Company, Hamilton, Ohio

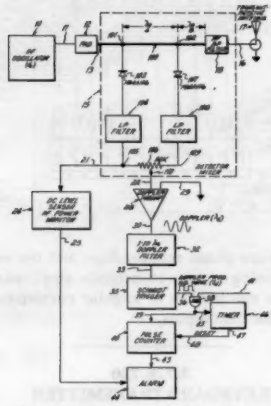
Filed Jan. 28, 1971, Ser. No. 110,732

Int. Cl. G01s *9/42*

U.S. Cl. 343—5 PD **11 Claims**

An intruder detection system in which an RF transmitter is connected through a length of transmission line to a transmit/receive antenna, both transmitter and antenna are matched to the line. Diode detectors are connected in op-

posite directions to the line at points spaced a quarter wave length apart. The diodes connect through low-pass filters to the balanced inputs of an AC coupled amplifier which extracts the doppler sine wave from the oppositely traveling transmitted and received waves on the line. The doppler sine wave



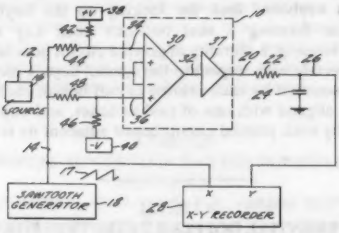
is squared and the pulses are integrated to trigger an alarm. A band pass filter is so positioned in the line to reduce false alarms by defining a specific radio frequency bandwidth and also allows the detectors to be used to time the transmitter oscillator.

3,728,722

PROBABILITY DENSITY FUNCTION GENERATOR

Joseph F. Sparacio, Monroe, Conn., and Richard S. Pierro, Bronx, N.Y., assignors to United Aircraft Corporation, Hartford, Conn.

Filed Oct. 22, 1971, Ser. No. 191,687
Int. Cl. G01s 9/02
U.S. Cl. 343—5 **11 Claims**



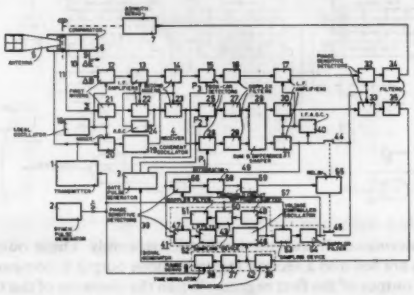
Apparatus for generating a curve of a probability density function of sampled voltage provides an averaged signal which is proportional to the average portion of time that the sampled voltage is within a predetermined increment of a voltage level within a range of interest. An X–Y recorder provides a curve of the averaged voltage for each level within the range of interest.

3,728,723

MONOPULSE RADAR APPARATUS

Bernard Gellekink, Hengelo (0), Netherlands, assignor to N.V. Hollandse Signaalapparaten, Hengelo (O), Netherlands

Filed July 30, 1970, Ser. No. 59,417
Claims priority, application Netherlands, Aug. 12, 1969, 6912229
Int. Cl. G01s 9/02
U.S. Cl. 343—7.4 **5 Claims**



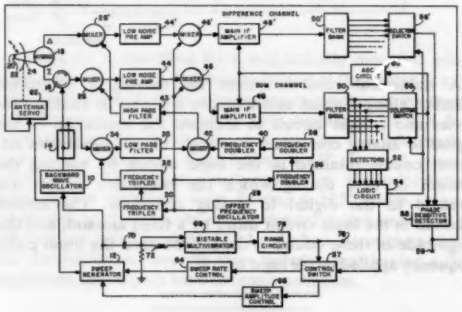
A monopulse radar apparatus for the automatic tracking of a moving target comprising a receiver for the coherent detection and filtering of received echo signals without undesired noise signals and undesired signals that are caused by signal and noise components falling within the passband of the filter due to the internal clutter movement of fixed targets. The receiver comprises a signal generator that provides only desired narrow-band signals to track the target when the frequency and phase of the signal generator matches that of the detected doppler signal, thereby resulting in optimum subclutter tracking.

3,728,724

ADAPTIVE SWEPT-FREQUENCY ACTIVE RADAR SEEKER

Frederick C. Alpers, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 12, 1971, Ser. No. 115,117
Int. Cl. G01s 9/02
U.S. Cl. 343—7.5 **6 Claims**



An adaptive swept frequency active radar seeker comprising an antenna, microwave components, and signal processing circuits arranged to provide guidance of a missile against a ship or prominant land target under all weather conditions. Microwave CW transmitter signals of moderate power are generated by one microwave tube. The frequency of the signals is controlled by a swept generator. The microwave signal is passed through a sidewall coupler, where a small portion is bled off for use in synthesizing a local oscillator signal

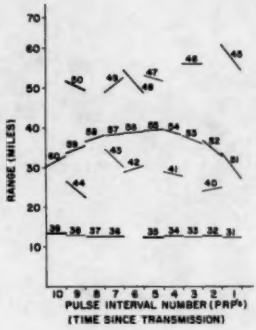
for heterdyne reception. Means are provided to control the swept generator by controlling the sweep rate and by controlling the sweep amplitude.

3,728,725

TARGET DISPLAY FOR PULSE-ECHO RETURN SYSTEM

Lowell W. Bauer, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed April 23, 1971, Ser. No. 136,897
Int. Cl. G01s 9/44
U.S. Cl. 343—9 7 Claims



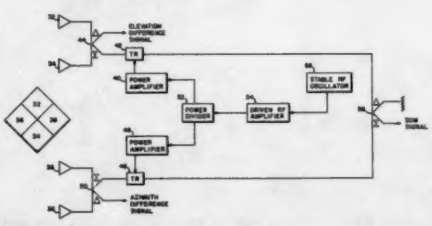
This invention relates to target displays for use in pulse-echo return systems such as radar and sonar systems. In this display a plurality of echo return or target signals are simultaneously displayed with each signal represented as a short straight directed line segment, the center or one end point of such line segment being positioned on the display screen with one coordinate determined by target range (pulse transit time) and the other coordinate determined in accordance with total elapsed time since transmission of the pulse resulting in that particular target return signal. The slope of each directed line segment is made proportional to target radial velocity (range rate) as determined by doppler shift of the return signal, and the intensity of display of the line segment is made proportional to the return signal amplitude. Return signals which correlate in range, in range rate and in signal amplitude then appear as a series of directed line segments connecting or very nearly connecting with each other to form a substantially continuous and readily identifiable target track while noise signals appear as unconnected lines of random orientation.

3,728,726

TRACKING RADAR FEED CIRCUITRY

Dean D. Howard, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 12, 1969, Ser. No. 870,565
Int. Cl. G01s 9/22
U.S. Cl. 343—16 M 6 Claims



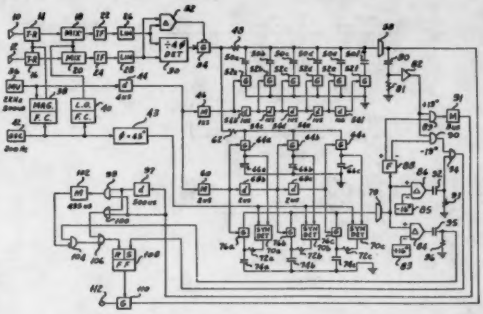
A monopulse tracking radar which includes a four-horn diamond feed and wherein the radiated power is doubled by the use of two separate feed lines.

3,728,727

PHASE INTERFEROMETER RADAR

Leo Botwin, Westport; Lawrence Chanzit, Stamford, both of Conn., and Kenneth A. Ruttenberg, Peabody, Mass., assignors to United Aircraft Corporation, Hartford, Conn.

Filed March 13, 1970, Ser. No. 19,332
Int. Cl. G01s 9/02
U.S. Cl. 343—16 R 17 Claims



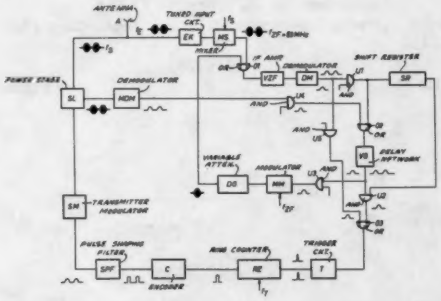
An improved phase interferometer radar provides a high-sensitivity output in accordance with the elevation angle of terrain as a function of range. The transmitted frequency is cyclically varied to produce corresponding variations in the apparent elevation angles. A plurality of synchronous detectors are employed which respond to such cyclic variations and provide a low-sensitivity signal indicating the elevation angle of terrain as a function of range. The high-sensitivity signal exhibits a plurality of ambiguities which are eliminated by employing the low-sensitivity signal to control the gating of the high-sensitivity signal to a display device.

3,728,728

METHOD AND APPARATUS FOR AUTOMATIC TRANSPONDER DELAY CORRECTION

Horst Vogel, Kornwestheim, and Herbert Kleiber, Ludwigsburg, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 5, 1970, Ser. No. 43,873
Claims priority, application Germany, June 7, 1969, P 19 29 042.7
Int. Cl. G01s 7/40
U.S. Cl. 343—17.7 9 Claims

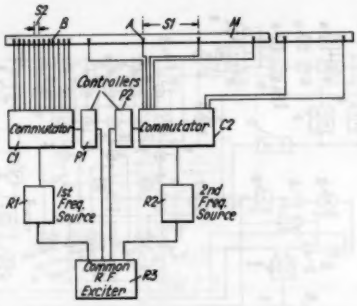


A method and apparatus is provided for determining the varying delays in a pulse interrogation system wherein a reply pulse is transmitted after a predetermined time following reception of an interrogation pulse. Transmitter and receiver delays are measured in a ring counter with the aid of a measuring pulse taken from the transmitter. This measured delay is subtracted from the predetermined time between the next pulse received and the following transmitted pulse thereby providing automatic transponder delay correction.

3,728,729
RADIO NAVIGATION BEACON INCLUDING ANTENNA ELEMENT COMMUTATION

Francis Giles Overbury, Hertfordshire, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 22, 1971, Ser. No. 210,699
Int. Cl. G01s 1/16
U.S. Cl. 343—108 **10 Claims**

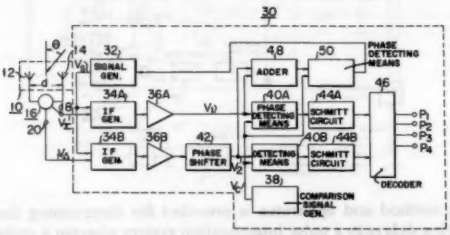


A radio navigation beacon system of the Doppler type having a simplified antenna arrangement. A main array employing 30 array elements spaced at four wavelengths and an auxiliary or reference array comprising 12 reference antenna elements spaced at one-third wavelength, are employed. A source of radio frequency energy is commutated to the separate radiator elements in order to simulate unidirectional or bidirectional constant velocity motion of the source. Navigational information is derived from this ground beacon arrangement by a receiving station as, for example, in an approaching aircraft on the basis that the Doppler shift of frequency observed at the receiving station is proportional to the cosine of the angle of reception with respect to the operating centerline of the system. Means are included for commutating the reference frequency to each reference antenna element, in turn, during the period that each main array element is radiating.

3,728,730
APPARATUS FOR DETECTING INCIDENT ANGLE OF RADIO WAVE

Kazuaki Takao, Kyoto, and Masakazu Takeuchi, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 16, 1970, Ser. No. 72,564
Claims priority, application Japan, Sept. 22, 1969, 44/75434
Int. Cl. G01s 3/46
U.S. Cl. 343—113 R **8 Claims**

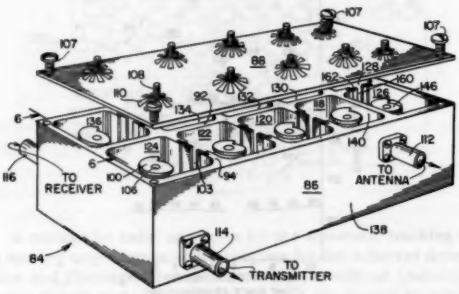


An apparatus for detecting an incident angle of radio wave can find the incident angle of radio signal without mechanical motion of any of antennas or radiator elements. The radio signals received by the paired radiator elements are utilized to produce a sum and a difference signals, with the phase relationship between them changing with a magnitude of the incident angle. By using a combination of polarities of the sum and the difference signals, the incident angle can be detected in digital form.

3,728,731
MULTI-FUNCTION ANTENNA COUPLER

Charles Choi, Hoffman Estates, and Maynard H. McGhay, Schaumburg, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 2, 1971, Ser. No. 159,194
Int. Cl. H04b 1/50
U.S. Cl. 343—180 **7 Claims**

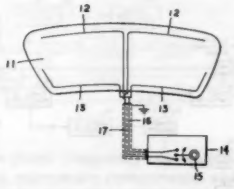


The antenna coupling circuit facilitates simultaneous reception and transmission of information carrying radio signals through a common antenna. A single filter having a plurality of helical resonator sections forms the harmonic filter of the transmitter, the preselector of the receiver, and a duplexer for connecting both the transmitter and receiver to a single antenna. A first plurality of the helical resonator sections are connected between the antenna and the input stage of a receiver which passes the band of frequencies to be received while reflecting the frequencies to be transmitted. A second plurality of helical resonator sections are connected between the output of a transmitter and the antenna which passes the frequencies to be transmitted while reflecting the frequencies to be received. The coupling between individual helical resonators is arranged to discriminate against frequencies higher than the passband. All of the cells of the filter circuit are mechanically connected together to form an integral compact structure.

3,728,732
WINDOW GLASS ANTENNA

Tsuyoshi Igarashi, Chiyoda-ku, Tokyo, Japan, assignor to Asahi Glass Company, Tokyo, Japan

Filed Dec. 2, 1970, Ser. No. 94,325
Claims priority, application Japan, Dec. 9, 1969, 44/116410
Int. Cl. H01q 1/32
U.S. Cl. 343—713 **4 Claims**



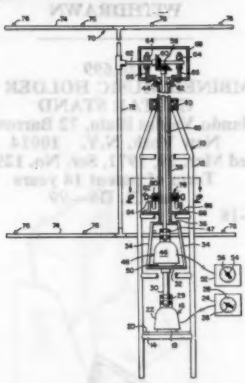
A window glass antenna having separate antenna elements for AM and FM radio reception. The antenna elements are connected to a radio receiver through a selector switch, permitting either the FM or AM antenna to be coupled to the radio receiver.

3,728,733

BEAM ANTENNA SELECTIVELY ORIENTED TO VERTICAL OR HORIZONTAL POSITION

James O. Robinson, 1297 Leonora Street, Akron, Ohio

Filed Feb. 24, 1972, Ser. No. 229,134
Int. Cl. H01q 3/00
U.S. Cl. 343—765 12 Claims



An antenna system particularly adapted for use in citizen band transmission and reception utilizing a beam antenna wherein means are provided for selectively orienting the beam horizontally or vertically from a remote control point.

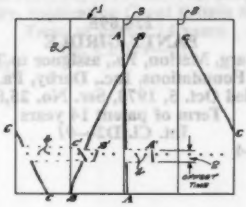
3,728,734

METHOD OF RESOLVING MULTIPLE SWEEP AMBIGUITIES ENCOUNTERED IN HIGH RESOLUTION GRAPHIC RECORDERS AND THE LIKE

Dwight E. Boegeman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 23, 1971, Ser. No. 136,807
Int. Cl. G01d 18/00
U.S. Cl. 346—1 6 Claims

A high resolution recording system is one in which the signal transit time significantly exceeds the recorder sweep so that N sweeps occur before the first recorded return. Thus, it becomes a problem to determine which sweep from time zero is represented by a recorded mark. This problem is referred to as the multiple sweep ambiguity. To resolve the ambiguity, the recorder sweep speed (stylus velocity) can be varied a small amount, such as 5 percent, and a series of marks made at this increased sweep speed. These marks will be offset a distance equal to N/20 of a sweep where N is the unknown number of



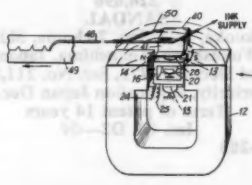
elapsed sweeps. A measurement of the offset distance provides a permanent index representative of the total elapsed time.

3,728,735

WRITING APPARATUS FOR USE WITH GALVANOMETER DEVICES

James A. Burton, Houston, Tex., assignor to AMF Incorporated

Filed May 3, 1971, Ser. No. 139,405
Int. Cl. G01d 15/24
U.S. Cl. 346—139 C 9 Claims



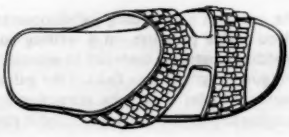
A stylus for use with a recording galvanometer instrument wherein desired stylus pressure on a writing surface is obtained by providing magnetic material in association with the stylus. The fringing magnetic flux field of the galvanometer attracts the magnetic material and the attractive force is transferred to the stylus to provide the desired stylus pressure.

DESIGNS

APRIL 17, 1973

226,695
PANTY GIRDLE
Herbert Barg, Merion, Pa., assignor to True Form Foundations, Inc., Darby, Pa.
Filed Oct. 5, 1970, Ser. No. 25,833
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—4

226,696
SANDAL
Tatsuo Fukuoka, 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan
Filed Dec. 23, 1971, Ser. No. 211,848
Claims priority, application Japan Dec. 7, 1971
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—283

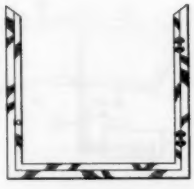


226,697
TIE CLIP OR SIMILAR ARTICLE
Robert Matas, 9810 Continental Ave., Forest Hills, N.Y. 11375
Filed July 12, 1971, Ser. No. 164,157
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—430

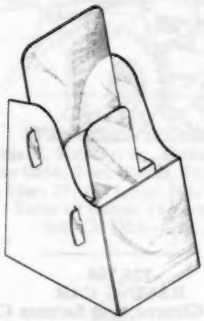
226,698
WITHDRAWN

226,699
COMBINED MUSIC HOLDER AND GUITAR STAND
Rolando Valdes Blain, 72 Barrow St., New York, N.Y. 10014
Filed Mar. 29, 1971, Ser. No. 129,311
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—18

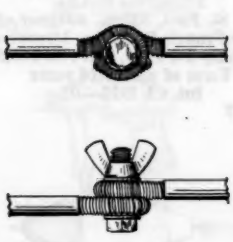
226,700
WALL HUNG HOLDER FOR RECORD ALBUMS
Robert J. Pratt, 70 Le Mans Drive, Apt. 1, Youngstown, Ohio 44512
Filed Apr. 21, 1971, Ser. No. 136,294
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



226,701
RETAINER FOR BROCHURES AND THE LIKE
Paul N. Gallat, 4333 E. 10th Lane, Hialeah, Fla. 33013
Filed Feb. 24, 1972, Ser. No. 229,247
Term of patent 14 years
Int. Cl. D6—*99;* D20—*03*
U.S. Cl. D6—184



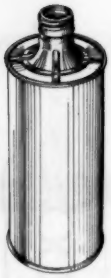
226,702
THREADED CONNECTOR
Ivan H. Moore, 345 W. 6th St., Garnett, Kans. 66032
Filed Nov. 27, 1970, Ser. No. 26,198
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—236



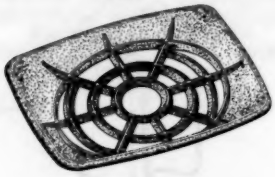
226,703
COMBINED BOTTLE AND CAP THEREFOR
Reginald Malcolm Broadhead, Maidenhead, England, assignor to Drum Horse Distillers Limited, London, England
Filed Nov. 30, 1971, Ser. No. 203,951
Claims priority, application Great Britain Sept. 13, 1971
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—72

226,704
BOTTLE
James Campbell Cobb, 16 Cowdroy Ave., Cammeray, New South Wales, Australia
Filed Dec. 31, 1970, Ser. No. 26,723
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—158

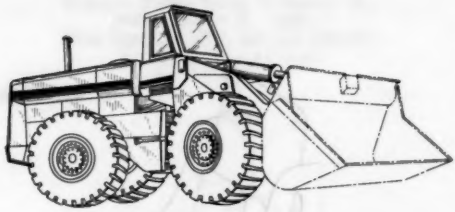
226,705
CAN OR THE LIKE
Arthur P. Zundel, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.
Filed Nov. 23, 1971, Ser. No. 201,607
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—218



226,706
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Continuation-in-part of design application Ser. No. 110,373, Jan. 27, 1971. This application Mar. 29, 1972, Ser. No. 239,410
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

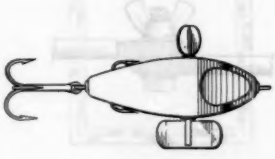


226,707
TRACTOR
Robert A. Skyer and Mitchell E. Kolak, Palatine, and Harry R. Wilson and Joseph H. Konefes, Libertyville, Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Apr. 16, 1971, Ser. No. 134,912
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3 A



226,708
RACING CAR
Thor Paul Torda, Glencoe, and Sarunas C. Uzgiris, Chicago, Ill., assignors to The Institute of Gas Technology, Chicago, Ill.
Filed Apr. 28, 1971, Ser. No. 138,394
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3 G

226,709
FISHING PLUG
George E. Ross, St. Paul, Minn., assignor of a fractional part interest to Francis R. Drake, Minnetonka, Minn.
Filed May 24, 1971, Ser. No. 146,598
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

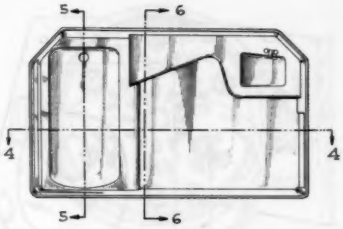


226,710
FISH LURE
Ewell J. Harris, Rte. 3, Box 135A, Adrian, Mich. 49221
Continuation-in-part of design application Ser. No. 23,537, June 19, 1970. This application Mar. 16, 1972, Ser. No. 235,475
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

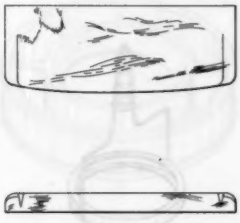
226,711
SPRINKLER HEAD
George E. Kunkle, Jr., Dallas, Tex. (P.O. Box 8056, Fort Worth, Tex. 76112)
Filed Mar. 29, 1971, Ser. No. 129,309
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

226,712
SPRAYER
Tetsuya Tada, 2–6, 3-chome, Nishi-Nakanobu, Shinagawa-ku, Tokyo, Japan
Filed Apr. 22, 1971, Ser. No. 136,629
Claims priority, application Japan Feb. 13, 1971
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17

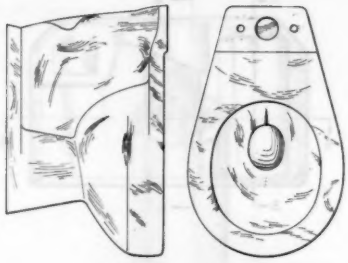
226,713
MODULAR BATHROOM
Levert Ray Johnson, Milton, Fla., assignor to Holiday-Hut Manufacturing Co., Inc., Milton, Fla.
Filed Jan. 15, 1971, Ser. No. 106,949
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



226,714
TOILET TANK COVER
Warren Gregory Anderson, Morganton, N.C., assignor to American Standard Inc., New York, N.Y.
Original design application Jan. 16, 1970, Ser. No. 20,960. Divided and this application Aug. 20, 1971, Ser. No. 173,717
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—66



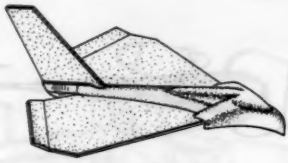
226,715
WATER CLOSET BOWL
Warren Gregory Anderson, Morganton, N.C., assignor to American Standard Inc., New York, N.Y.
Original design application Jan. 16, 1970, Ser. No. 20,960. Divided and this application Aug. 20, 1971, Ser. No. 173,718
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—67



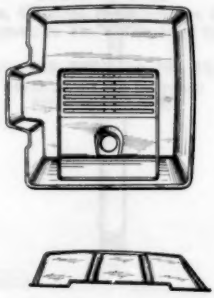
226,716
GAME BOARD INDICATOR DEVICE
Thomas D. Ledgerwood, 823 Mockingbird Lane, Norman, Okla. 73069
Filed Jan. 25, 1971, Ser. No. 109,753
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

226,717
BALL WHIRLING TOY
Melvin L. Vincent, 17535 St. Aubin, Detroit, Mich. 48215
Filed Apr. 26, 1971, Ser. No. 137,723
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 K

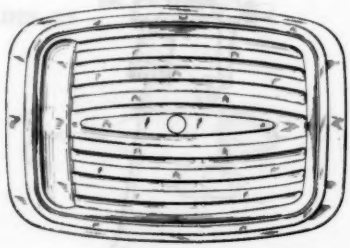
226,718
TOY AIRPLANE
Jack G. McAllister, Minneapolis, Minn., assignor to General Mills Fun Group, Inc.
Filed Sept. 8, 1971, Ser. No. 178,576
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



226,719
SHROUD FOR ROTARY MOWERS AND THE LIKE
John A. Gale, Wayzata, and Robert E. Haueter, Minneapolis, Minn., assignors to Toro Manufacturing Company, Minneapolis, Minn.
Filed Jan. 25, 1971, Ser. No. 109,751
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 B

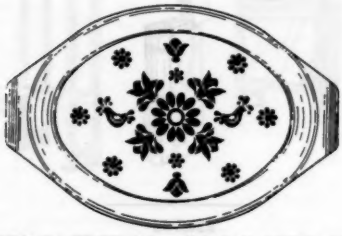


226,720
TRAY OR THE LIKE
James B. Swett, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Nov. 2, 1971, Ser. No. 195,070
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—1 B



226,721
PLATE
John T. Dolby, Winnetka, and James S. Adler, Chicago, Ill., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 14, 1970, Ser. No. 26,471
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10 A

226,722
CASSEROLE COVER
Gregory Mirow, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed June 14, 1971, Ser. No. 153,152
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15 A

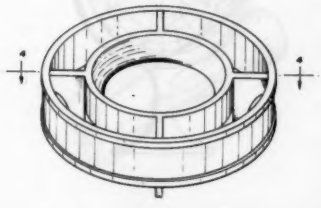


226,723
CASSEROLE DISH OR THE LIKE
Gregory Mirow, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed June 14, 1971, Ser. No. 153,157
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15 A

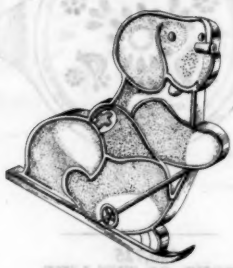
226,724
CASSEROLE COVER OR THE LIKE
Gregory Mirow, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed June 14, 1971, Ser. No. 153,158
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15 A

226,725
BOWL OR THE LIKE
Gregory Mirow, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed June 14, 1971, Ser. No. 153,159
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15 A

226,726
BEVERAGE WARMING STAND
Arthur Eckstein, Roslyn Heights, N.Y., assignor to Chemex Corporation, New York, N.Y.
Filed Jan. 11, 1971, Ser. No. 105,758
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—10 C



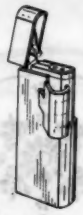
226,727
JEWELRY FINDING
Richard Charles, Townhouse East, Apt. K5, Manlius, N.Y. 13104
Filed Dec. 9, 1970, Ser. No. 26,374
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1



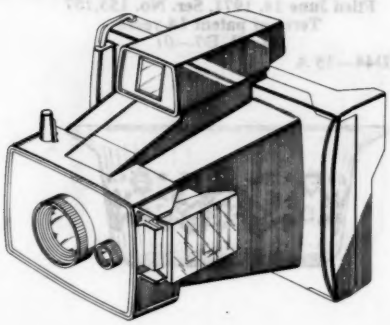
226,728
LAMP
Victor V. Nyssen, Los Alamitos, Calif., assignor to Brightco Electronics Corporation, Westminster, Calif.
Filed Dec. 6, 1971, Ser. No. 205,468
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E

226,729
COMBINED LANTERN AND INSECT KILLER
Robert E. Iannini, Milford, N.H., assignor to Rid-O-Ray Inc., Milford, N.H.
Filed May 17, 1971, Ser. No. 144,396
Term of patent 14 years
Int. Cl. D26—*03;* D22—*06*
U.S. Cl. D48—24

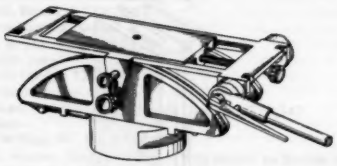
226,730
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi-shi, Saitama, Japan
Filed Dec. 27, 1971, Ser. No. 212,850
Term of patent 14 years
Int. Cl. D48—*27*
U.S. Cl. D27—5



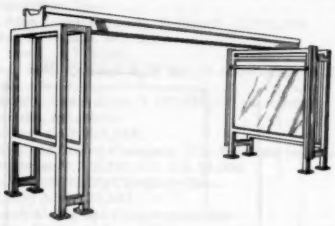
226,731
PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
James M. Conner, Mamaroneck, N.Y., and Milton S. Dietz, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Mar. 15, 1971, Ser. No. 124,616
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



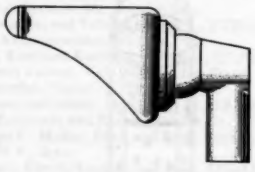
226,732
CAMERA TRIPOD HEAD
Melville R. Pollard, Jr., Woodland Hills, Calif., assignor to Cintel Corporation, Los Angeles, Calif.
Filed Apr. 12, 1971, Ser. No. 133,485
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 G



226,733
OVERHEAD OPTICAL HEAD SUPPORT TRACK FOR A PHOTOREPRODUCTION UNIT
Joseph H. Wally, Jr., and Samuel E. Wilson, Shawnee Mission, Kans., assignors to Western Blue Print Co., Kansas City, Mo.
Filed May 28, 1971, Ser. No. 148,279
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



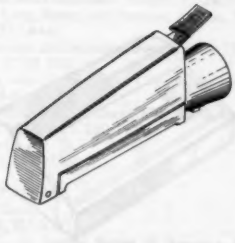
226,734
TRACHEOTOMY MASK
William R. King, Denver, Colo., assignor to Sandoz-Wander, Inc., Hanover, N.J.
Continuation-in-part of abandoned design application Ser. No. 149,403, May 28, 1971. This application Nov. 10, 1971, Ser. No. 197,645
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 K



226,735
SURGICAL KNIFE
Joseph Navara, 2105 W. Walton St., Chicago, Ill. 60622
Filed Jan. 7, 1971, Ser. No. 104,844
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R

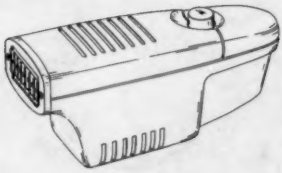
226,736
FINGER MANICURING GRIP
Isak Benis, 2165 Matthews Ave., Bronx, N.Y. 10462
Filed May 6, 1971, Ser. No. 141,068
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 C

226,737
HAIR GROOMING IMPLEMENT HOLDER
Martin J. Wolff, West Haven, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 12, 1971, Ser. No. 142,862
Term of patent 14 years
Int. Cl. D4—*03*; D28—*03*
U.S. Cl. D86—10 F

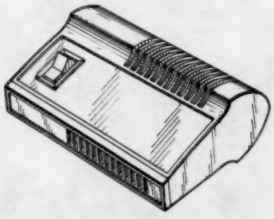


226,738
HAIR ROLLER
Nai-Keung Chen, Fairfield, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Sept. 20, 1971, Ser. No. 182,303
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

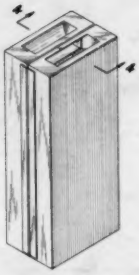
226,739
HAIR STEAMER
Jay Dobyin, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.
Filed Nov. 19, 1971, Ser. No. 200,657
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



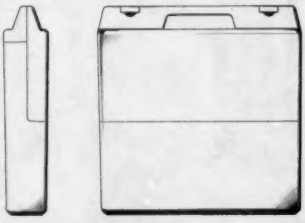
226,740
HAIR DRYER
Norman A. Steinkamp, Chicago Heights, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 29, 1971, Ser. No. 213,804
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



226,741
COMBINED STORAGE AND CARRYING CONTAINER
Everett R. Yonce, 464 42nd St., Oakland, Calif. 94609
Filed Apr. 16, 1971, Ser. No. 134,926
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1



226,742
CARRYING CASE
Robert E. Dustin, Brookline, Mass., assignor to Dustin & Davenport Incorporated, Brookline, Mass.
Filed May 28, 1971, Ser. No. 148,273
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



226,743
TOTE BAG
Robert M. Lee, New York, N.Y., assignor to Hunting World Incorporated, New York, N.Y.
Filed Jan. 10, 1972, Ser. No. 216,868
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

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TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF APRIL, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A/S W. Jordon Borste & Penselfabrik: *See—*
Spydevold, Baard, 3,727,260.

AB Billingsfors-Langed: *See—*
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AB Volvo Penta: *See—*
Bagge, Nils Olof, 3,727,574.

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Abcor, Inc.: *See—*
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Abe, Takashi; Aizawa, Koji; and Oguri, Masanobu, to Showa Aluminium Kabushiki Kaisha. Method for forming a chemical coating on aluminum or aluminum alloy. 3,728,164, Cl. 148-6.270.

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Abel, Martin L. Method of making a package sleeve bearing. 3,727,279, Cl. 29-149.50r.

Abex Corporation: *See—*
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Eddy, Thomas A.; and White, Charles E., 3,727,969.
McCune, Robert B.; and Koment, Edward J., 3,727,559.

Abic Ltd.: *See—*
Haber, Raphael G.; and Schoenberger, Eva, 3,728,452.

Abplanalp, Thomas L., to Christensen Diamond Products Company. Diamond drill bit. 3,727,704, Cl. 175-329.000.

Abrams, Martin; and Tafel, Kenneth B., to AES Technology Systems, Inc., mesne. Apparatus and method of copying on a plurality of diverse copy media. 3,728,020, Cl. 355-66.000.

Accles & Shelvoke Limited: *See—*
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Acme Lane Co., Inc.: *See—*
Pabich, Richard W.; and Treiber, Richard W., 3,727,821.

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Adler, Alan J.; and Kennedy, William S., 3,727,708.

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Zacks, Leo L., 3,728,002.

Adamo, Daniel M. Ground fault circuit interrupter. 3,728,581, Cl. 317-18.00a.

Adams, Arnold L. Grain dryer. 3,727,556, Cl. 34-102.000.

Adams Industries, Inc.: *See—*
Tilp, George E., 3,728,517.

Adams, Lyle C., to Boeing Company, The. Feedrate control system for milling machines. 3,728,595, Cl. 318-39.000.

Adams Rite Manufacturing Company: *See—*
Geer, Larry A., 3,727,482.

Addressograph-Multigraph Corporation: *See—*
Schmidlin, Raymond J.; and Germuska, Richard W., 3,728,017.
Stevko, Phillip J.; Petrella, Joseph L.; and Dissauer, Gerald A., 3,728,023.

Adicoff, Arnold, to United States of America, Navy. Method of preparing ammonium perchlorate crystals of controlled size. 3,728,086, Cl. 23-302.000.

Adkar, Chintamani K., to United States of America, Navy. Magnetic navigation system. 3,728,525, Cl. 235-150.271.

Adkins, William J., to Corning Glass Works. Dot matrix graphic character generator. 3,728,711, Cl. 340-324.0ad.

Adler, Alan J.; and Kennedy, William S., to Acurex Corporation. Force balance weigh cell. 3,727,708, Cl. 177-178.000.

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Advanced Drainage Systems, Inc.: *See—*
Martin, Ronald C.; and Sixt, Marty E., 3,727,953.

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Sauer, Theo; and Schulz, Gunter, Dr., 3,728,280.
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Agnew, Thomas I., to Gulton Industries, Inc. Ground continuity monitoring system. 3,728,582, Cl. 317-18.00c.

Ahrenberg, Kurt. Apparatus for moistening mixable materials. 3,727,894, Cl. 259-154.000.

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Air Preheater Company, Inc., The: *See—*
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Abe, Takashi; Aizawa, Koji; and Oguri, Masanobu, 3,728,164.

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Alexandrov, Albert Ivanovich; Levin, Solomon Isaakovich; Chestnov, Valery Fedorovich; Kovaleva, Raisa Markovna; Birjukova, Tatyana Semenovna; Burko, Albert Ivanovich; and Naumov, Mikhail Grigorievich, to Vsesojuzny nauchno-issledovatelsky Institut Istochniov sveta. Automatic apparatus for welding up and evacuation of electrovacuum devices. 3,728,005, Cl. 316-31.000.

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Allsop, James D.: *See—*
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Allsop, Michael G.: *See—*
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Alps Electric Co., Ltd.: *See—*
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Archer, Sydney; and Schulenberg, John W., to Sterling Drug Inc. Phenylalkylaminotetrahydroisoquinolines. 3,728,352, Cl. 260-287.00r.

Arenskov, Peter T. Strainer-stopper assembly. 3,727,763, Cl. 210-163.000.

Arganbright, Robert P., to Petro-Tex Chemical Corporation. Production of N-butenes from ethylene. 3,728,415, Cl. 260-683.15r.

Arita, Muneyoshi: *See—*
Sakai, Hidetami; and Arita, Muneyoshi, 3,728,234.

Arkhipov, Stanislav Mikhailovich: *See—*
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Entremont, John C. D.; and Taylor, Charles R., 3,728,101.
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Arnaudin, Edwin H., Jr., to Anaconda Wire and Cable Company. Shielded power cable. 3,728,474, Cl. 174-115.000.

Arnell, Clifford G., to United Aircraft Corporation. Regenerative FET converter circuitry. 3,728,556, Cl. 307-251.000.

Arntson, Gary L.; and Rasmussen, Rom, to General Motors Corporation. Inflatable occupant restraint cushion. 3,727,942, Cl. 280-150.0ab.

Arrb Mfg. Company: *See—*
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Arruda, Frederick Earl: *See—*
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Asahi Glass Company, Ltd.: *See—*
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Yano, Nobumitsu; Fukushima, Masao; Kishi, Masanori; and Nagayoshi, Fumio, 3,728,329.

Ashe, Benedict H., Jr.; and Fox, Homer M., to Phillips Petroleum Company. Porous electrode having open feed cavity. 3,728,233, Cl. 204-59.00r.

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Ashton, Albert A., to Youngstown Sheet and Tube Company. Loading arm. 3,727,641, Cl. 137-615.000.

Ashworth, James E., to U.S. Steel Corporation. Universal hinge. 3,727,266, Cl. 16-158.000.

Aslanbayrak, Ali R.; and Woods, Ovid W., to Abex Corporation. Simultaneous dual hand lever control. 3,728,498, Cl. 192-131.00r.

Aspinwall, Ronlad A.; and Graham, MacKellar K., to Sperry Rand Corporation. Fluid filter. 3,727,761, Cl. 210-130.000.

Association of Motion Picture and Television Producers Inc., The: *See—*
Vlahos, Petro, 3,728,495.

Astro-Arc Co.: *See—*
Gedgaudas, Mindaugas E., 3,728,515.

Atkins, Carl E., to Wagner Electric Corporation. Lamp outage indicator. 3,728,705, Cl. 340-251.000.

Atlantic Richfield Company: *See—*
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Hearn, Daniel P., 3,728,614.

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Augunas, Algis G.; Louton, James C., Jr.; and Rafalik, Roman, to General Motors Corporation. Occupant restraint system. 3,727,943, Cl. 280-150.0sb.

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Automobiles Peugeot: *See—*
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Avco Corporation: *See—*
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Averbook, Charles J.; and Schmier, Robert J. Ski protective device. 3,727,934, Cl. 280-11.37k.

Aviatest GmbH: *See—*
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Baab, Albert, to Schneider, Jos., & Co., Optische Werke. Iris diaphragm with linear aperture scale. 3,727,531, Cl. 95-64.00r.

Babb, Randall K., to Arrb Mfg. Company. Universal press. 3,727,291, Cl. 29-251.000.

Badia, Frank A.; Anderson, David B.; and Kirby, Gary N., to International Nickel Company, Inc., The. Wrought copper nickel alloy. 3,728,106, Cl. 75-159.000.

Baer, Ralph H., to Sanders Associates, Inc. Television gaming and training apparatus. 3,728,480, Cl. 178-6.800.

Bagge, Nils Olof, to AB Volvo Penta. Outboard drive for a boat. 3,727,574, Cl. 115-34.00r.

Baginski, Martin Robert, to Ashtabula Bow Socket Company. Method and apparatus for forming a blank. 3,727,445, Cl. 72-75.000.

Baguelin, Yves: *See—*
Brille, Maurice; and Baguelin, Yves, 3,727,399.

Bahnsen, Erwin B., to Steiner American Corporation. Towel dispensing cabinet with scraper attachment. 3,728,001, Cl. 312-38.000.

Bailey, Joseph T., to American Lava Corporation. Leachable ceramic cores. 3,727,670, Cl. 164-132.000.

Bailey, Robert E.: *See—*
Evans, Grant; Petty, Billy Joe; and Bailey, Robert E., 3,727,740.

Bailly, Francois, to Societe Anonyme pour l'Equipment Electrique des Vehicules S.E.V. Marchal. Apparatus for correcting the effect of variation in load on the direction of headlight beams of vehicles. 3,728,538, Cl. 240-7.1lj.

Bainbridge, Cecil, to Rohr Industries, Inc. Suspension mechanism for sliding doors. 3,727,349, Cl. 49-411.000.

Baker, Donald C.; and Yessayan, Krikor, to Case, J. I., Company. Support means for cylinder conduits. 3,727,699, Cl. 172-809.000.

Baker, Gary, 1/3 each to Patton, Don A. and Brauer, James S. Four-way dental syringe. 3,727,310, Cl. 32-22.000.

Baker, J. T., Chemical Company: *See—*
Michelotti, Francis W.; Jordan, John M.; and Cook, Neville P., 3,728,400.

Baker, Philip G., to Polaroid Corporation. Photographic lighting unit. 3,728,536, Cl. 240-1.300.

Bakker, Hans: *See—*
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Balch, David T., to United Aircraft Corporation. Helicopter blade. 3,728,045, Cl. 416-223.000.

Ball, Claire G.; Grimm, Arthur C.; and Melville, Thomas, to United States Steel Corporation. Reinforced composite. 3,728,211, Cl. 161-170.000.

Balm Paints Limited: *See—*
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Banes, Ralph E.: *See—*
Visos, Charles D.; Love, John J.; Smith, Carl A.; and Banes, Ralph E., 3,727,836.

Bang, Mogens W.; and Kronenwetter, Richard P., to Stackpole Carbon Company. Adjustable electrical control device with longitudinal indexing for slide switch. 3,728,499, Cl. 200-16.00f.

Bank of Higginsville: *See—*
Slusher, Emmet Garr, 3,727,746.

Bankert, Ralph A., to Hercules Incorporated. Diallylamine-amide-polyaldehyde resins having utility as wet and dry strengthening agents in papermaking. 3,728,216, Cl. 162-167.000.

Bardani, Frank M. Controlled Medications Limited Controlled release medicament. 3,728,445, Cl. 424-22.000.

Bardell, Paul H., Jr.; Barson, Fred; Benjamin, Charles E.; and Pecoraro, Raymond P., to International Business Machines Corporation. Semiconductor device fabrication method and product thereby. 3,728,166, Cl. 148-175.000.

Barenyi, Bela; Renner, Hermann; and Sacco, Bruno, to Daimler-Benz Aktiengesellschaft. Arrangement of front and/or rear lights of motor vehicles. 3,728,537, Cl. 240-7.100.

Barie, Walter P., Jr.; Franke, Norman W.; and Singerman, Gary M., to Gulf Research & Development Company. Liquid stabilizers for vinyl chloride polymers. 3,728,282, Cl. 252-400.000.

Barkelew, Richard C. Replaceable combination valve seat and flow diverter. 3,727,637, Cl. 137-561.000.

Barkhudarov, Eduard Mikhailovich; Kervalishvili, Nikolai Arsenovich; and Kortkhondzhia, Vladimir Parmenovich. Device for applying thin films to articles. 3,728,246, Cl. 204-298.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Itter, Friedhelm; Feth, Max; and Zimmerbeutel, Gerd, 3,727,767.

Barnes, Richard D., to Southern Imperial, Inc. Ground cover. 3,727,347, Cl. 47-32.000.

Barnhart, Robert R.: *See—*
Kindle, Robert W.; Barnhart, Robert R.; and Paul, Philip T., 3,728,192.

Barr, William H. Torque limiting clutch. 3,727,732, Cl. 192-26.000.

Barriere, Alain; and Germain, Gerard, to Automobiles Peugeot and Regie Nationale des Usines Renault. Mechanism for adjusting the position and folding down the backrest of a seat and a seat, in particular for an automobile vehicle, including said mechanism 3,727,978, Cl. 297-369.000.

Barson, Fred: *See—*
Bardell, Paul H., Jr.; Barson, Fred; Benjamin, Charles E.; and Pecoraro, Raymond P., 3,728,166.

Barthalon, Maurice. System for establishing a pneumatic connection between an object and a wall. 3,727,715, Cl. 180-118.000.

Barton, Derek Harold Richard, to Research Institute for Medicine and Chemistry Inc. Preparation of 9a-fluoro-11-oxo-steroids. 3,728,337, Cl. 260-239.55d.

Basevi, Sandro: *See—*
Arbitrio, Paolo; Basevi, Sandro; Fornari, Alfredo; and Sensi, Antonio, 3,727,669.

BASF Wyandotte Corporation: *See—*
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Bash, Ignatius F.: *See—*
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Basic Sciences Corp.: *See—*
Scott, Harold W.; and Kelemencky, Monroe R., 3,728,639.

Bass, Rudi. Resilient support. 3,727,870, Cl. 248-350.000.

Bates, William C.; and True, Thomas T., to General Electric Company. Luminance notch filter. 3,728,476, Cl. 178-5.400.

Battini, Renato: *See—*
Claesson, Georg; and Battini, Renato, 3,727,896.

Bauer, Kurt: *See—*
Deutscher, Hans-Christian; and Bauer, Kurt, 3,727,262.

Bauer, Lowell W., to General Electric Company. Target display for pulse-echo return system. 3,728,725, Cl. 343-9.000.

Bauer, Ralf Rudiger, to International Business Machines Corporation. Method of making flat cables. 3,728,424, Cl. 264-40.000.

Bauer, William Valentine, to Lummus Company, The. Three-stage combustion. 3,727,562, Cl. 110-1.00p.

Bauermeister, Heinz. Upper arm swimming ring. 3,727,252, Cl. 9-344.000.

Baulieu, William H.: *See—*
Conners, John A.; Liepelt, Donald W.; and Baulieu, William H., 3,727,883.

Baus, Ammon; and Keller, Frederick C., to Carey-McFall Company. Hinge type branch holder for artificial tree. 3,728,202, Cl. 161-24.000.

Bawden, Peter, Drilling Services Ltd.: *See—*
Davies, Philip H., 3,727,414.

Baxter Laboratories, Inc.: *See—*
Louderback, Allan L., 3,728,226.

Bayer, Edward Bernard. Variable speed drive mechanisms. 3,727,473, Cl. 74-198.000.

Baylor, Richard A. Clock actuated awakening device. 3,727,395, Cl. 58-19.00c.

Bazouin, Andre; and Lefort, Marcel, to Rhone-Poulenc SA. Process for the preparation of aryldimethylchlorosilane. 3,728,368, Cl. 260-448.20p.

Beacham, Walter Gary, to BTI Ltd. Telephone answering apparatus. 3,728,489, Cl. 179-6.00r.

Beatrice Foods Co.: *See—*
Luksas, Anthony J., 3,728,128.

Beazley, Aubrey G., to Farah Manufacturing Company, Inc. Automatic sewing apparatus. 3,727,567, Cl. 112-121.110.

Beazley, Aubrey G., to Farah Manufacturing Company, Inc. Pickup and transfer device. 3,727,775, Cl. 210-1.0bc.

Beck, Henry H. Air cushion conveyor lift cells. 3,727,984, Cl. 302-29.000.

Beck, James R., to Lilly, Eli, and Company. 1-(2-Carboxyphenyl)-5,7-dimethoxy-3,4-dihydrocarbostyril intemediates for acronyces. 3,728,350, Cl. 260-287.00r.

Becker, Karl V.: *See—*
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Becker, Raymond: *See—*
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Becker, Richard W.; Ford, John A., Jr.; Fields, Donald L.; and Reynolds, Delbert D., to Eastman Kodak Company. Selective transfer system and compounds for employment therein. 3,728,113, Cl. 96-3.000.

Beffa, Fabio: *See—*
Lienhard, Paul; Beffa, Fabio; and Soiron, Charles, 3,728,328.

Beguiristain, Luis, II, to Chayes Dental Instrument Corporation, mesne. Piloted shut-off valve. 3,727,877, Cl. 251-30.000.

Beier, Helmut, to Siemens Aktiengesellschaft. High voltage circuit breaker. 3,728,504, Cl. 200-144.0ap.

Beiersdorf Aktiengesellschaft: *See—*
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Belisaire, Robert: *See—*
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Belk, Earl H. Cover. 3,727,972, Cl. 296-137.00r.

Bell, Graham H. Single set-up sequential heat process for making diamond heat sinks. 3,727,667, Cl. 164-80.000.

Bell Telephone Laboratories, Incorporated: *See—*
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Chu, Ta-Shing, 3,728,644.
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Bell-Canada-Northern Electric Research Limited: *See—*
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Gaisenok, Arseny Alexandrovich; Belyavin, Yury Pavolovich; Glozman, Moisei Kalmanovich; Rakovsky, Boris Albertovich; Rakovsky, Emmanuil Albertovich; Chikov, Gennady Mikhailovich; Maslovsky, Valery Georgievich; Lushkov, Evgeny Natanovich; and Velsman, Rix Rcovich, 3,727,416.

Bemelmann, Karl; and Koch, Hubert, to Messer G riesheim G.m.b.H. Device for clamping and moving together thermoplastic pipes for flush-welding. 3,727,289, Cl. 29-237.000.

Bencic, Robert S., to Eaton Corporation. Dispensing apparatus. 3,727,844, Cl. 239-414.000.

Benda, David, to GTE Sylvania Incorporated. Cathode cap. 3,728,574, Cl. 313-337.000.

Bendix Corporation, The: *See—*
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Miller, Donald L.; and Puro, John F., 3,727,736.
Myers, Lawrence R.; and Lakovits, John J., 3,727,516.
Shapiro, William A., 3,728,715.
Slavin, Michael; Emery, Raymen Forrest; Carp, Ralph Wolf; and Ang, Leoncio Tan, 3,727,517.

Beninati, John J.; Duron, Paul P.; and Perry, James L., to Airco, Inc. Apparatus for winding insulation onto vessels. 3,727,851, Cl. 242-7.230.

Benjamin, Charles E.: *See—*
Bardell, Paul H., Jr.; Barson, Fred; Benjamin, Charles E.; and Pecoraro, Raymond P., 3,728,166.

Benjamin, John Stanwood, to International Nickel Company, Inc. Superalloys by powder metallurgy. 3,728,088, Cl. 29-182.500.

Benjamin, Milton L., to Erickson Tool Company. Collet chuck. 3,727,928, Cl. 279-1.001.

Benjamin, Milton L.; and Miles, Wilbur N., to Erickson Tool Company. Adjustable floating reamer. 3,728,037, Cl. 408-168.000.

Bennett, Foster C., to Dow Chemical Company, The. Apparatus for aligning and seating the shot cylinder in a metal die casting machine. 3,727,675, Cl. 164-316.000.

Bennett, Robert George, to Avco Corporation. Lance with distance measuring sub-system. 3,727,897, Cl. 266-34.0lm.

Bens, Everett M.; and Morley, Carl H., to United States of America, Navy. Chemiluminescent formulation containing inorganic salt solution. 3,728,270, Cl. 252-188.300.

Benson, Clark K.: *See—*
Caridis, Andrew A.; and Benson, Clark K., 3,727,801.

Bentley, David R.: *See—*
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Berg, David R., to General Electric Company. Room air-conditioner one-piece chassis. 3,727,421, Cl. 62-262.000.

Berg, Nephi Edward, to Hendrix Wire & Cable Corporation. Character display terminal. 3,728,710, Cl. 340-324.00a.

Bergemann, Horst: *See—*
Eaves, Dennis Robert; and Bergemann, Horst, 3,727,432.

Berger, Curt, to Les Forges de Zeebrugge S.A. Process for the surface treatment of non metallic cases such as cartridges, and the so treated cases. 3,727,512, Cl. 86-20.000.

Berger, Sol J. Comestible slicing device. 3,727,307, Cl. 30-304.000.

Bergh, Eugene H., to Minnesota Mining and Manufacturing Company. Steel-ceramic railjoint endpost. 3,727,838, Cl. 238-152.000.

Bergwerksverband GmbH: *See—*
Reerink, Wilhelm; Lehmann, Joachim; and Kleisa, Kurt, 3,728,229.

Berisford, Robert; and Joinson, Eric P., to Du Pont de Nemours, E. I., and Company. Production of high aspect ratio acicular rutile TiO. 3,728,443, Cl. 423-610.000.

Bernard, Arthur A.; and Bernard, Richard A., to Bernard Welding Equipment Company. Thermionic insulated arc welding gun. 3,728,514, Cl. 219-130.000.

Bernard, Richard A.: *See—*
Bernard, Arthur A.; and Bernard, Richard A., 3,728,514.

Bernard Welding Equipment Company: *See—*
Bernard, Arthur A.; and Bernard, Richard A., 3,728,514.

Berry, Jean-Luc, to Remy, E. P., et Cie. Sealing gasket and sealed joint using the said gasket. 3,727,926, Cl. 277-212.00f.

Bertelson, Richard Edward, to General Electric Company. Fluidic seal for segmented nozzle diaphragm. 3,728,041, Cl. 415-189.000.

Bertram, Uwe; Isernhagen, Rolf; Neuhaus, Hans; Schwandt, Jurgen; and Stewen, Ludolf, to U.S. Philips Corporation. Constructable logic system. 3,728,534, Cl. 235-184.000.

Besser, Paul J.: *See—*
Mee, Jack E.; Besser, Paul J.; Pulliam, George R.; Heinz, David M.; and Elkins, Perry E., 3,728,152.

Bethlehem Steel Corporation: *See—*
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Bethune, Edwin M.: *See—*
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Bevis Industries, Inc.: *See—*
Hyatt, Frederick; and Arruda, Frederick Earl, 3,727,273.

Bianchetta, Donald L.; Guhl, Richard E.; Kershaw, Samuel L.; and Szentes, John F., to Caterpillar Tractor Company. Vehicle power and brake cooling control. 3,727,730, Cl. 192-3.00r.

Bidanset, Edward J., to Technicon Instruments Corporation. Tape cartridge for use in automated sample analysis apparatus. 3,728,081, Cl. 23-259.000.

Biegert, Karl E.; and Tice, Robert M., to Ultronic Systems Corporation. Apparatus for controlling output data rate. 3,728,683, Cl. 340-172.500.

Biever, Robert E. Portable high volume gas supply system. 3,727,651, Cl. 141-231.000.

Bijleveld, Eduard; and Cleij, Jan, to N.V. Octrooien Maalschappij Activit. Process for the purification of gases and vapors. 3,727,379, Cl. 55-73.000.

Binage, Derek Sidney: *See—*
Melrose, David Robert; and Binage, Derek Sidney, 3,727,865.

Biniores, Frank D. Watercloset safety control. 3,727,243, Cl. 4-41.000.

Bird, Forrest Morton; and Pohndorf, Henry Louis. Apparatus for mixing gases. 3,727,627, Cl. 137-100.000.

Birjukova, Tatyana Semenovna: *See—*
Alexandrov, Albert Ivanovich; Levin, Solomon Isaakovich; Chestnov, Valery Fedorovich; Kovaleva, Raisa Markovna; Birjukova, Tatyana Semenovna; Burko, Albert Ivanovich; and Naumov, Mikhail Grigorievich, 3,728,005.

Bishop Eaves & Sons Limited: *See—*
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Blackmore, Joseph J.; and Glunt, Perry G. Liquid flow diffusion and straightening apparatus. 3,727,643, Cl. 138-41.000.

Blackwell Electronics Ind. Co., Ltd.: *See—*
Nozawa, Shunichi; Kuroi, Hisashi; Hatada, Masamichi; and Fukuyama, Shunsaku, 3,728,578.

Blanc, Martin D.: *See—*
Retzyl, Rudolph; and Blanc, Martin D., 3,728,021.

Blanchaud, Maurice; and Bournier, Edgard. Installation for trimming mushrooms and other vegetables. 3,727,542, Cl. 99-637.000.

Blank, Izhak, to Hydrophilics International, Inc. Chemical composition for viscosity control and film forming materials. 3,728,314, Cl. 260-80.800.

Blank, Izhak, to Hydrophilics International, Inc. Optical contact lenses and related devices. 3,728,317, Cl. 260-86.10r.

Blankenzee, Johan: *See—*
Kaufhold, Norbert; Konig, Klaus; Keller, Heinrich; De Graaf, Jan G.; Blankenzee, Johan; Bakker, Hans; and Plettenburg, Carolus, 3,727,862.

Blea, Cyril: *See—*
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Blemly, Marvin S.; and Becker, Raymond, to Webb, Jervis B., Company. Vehicle propulsion and guide truck system. 3,727,560, Cl. 104-147.00r.

BLH Electronics Inc.: *See—*
Senour, Donald A.; and Kobel, Janusz S., 3,728,625.

Blickens, Donald Arthur: *See—*
Kupfer, David; Roscoe, Henry George; and Blickens, Donald Arthur, 3,728,455.

Blinkhorn, Harold L., to Lee, Raymond, Organization, Inc., The. Printed circuit boards with knockouts. 3,728,471, Cl. 174-68.500.

Bliss & Laughlin Industries, Incorporated, mesne: *See—*
Borough, Howard C.; and Pontarelli, Donald A., 3,728,521.

Bloch, Elliott G.; and Bloch, Eric M. Reel and display stand therefor. 3,727,751, Cl. 206-50.000.

Bloch, Eric M.: *See—*
Bloch, Elliott G.; and Bloch, Eric M., 3,727,751.

Block Engineering Inc.: *See—*
Hirschfeld, Tomas, 3,728,029.
Vogenthaler, Richard L.; and Margoshes, Marvin, 3,728,576.

Bly, Herbert Arthur. Spring clip retainer for can closure. 3,727,790, Cl. 220-54.000.

Boari, Gianfranco: *See—*
Passino, Roberto; and Boari, Gianfranco, 3,728,248.

Bochan, John, to General Electric Company. Additive dispensing system. 3,727,434, Cl. 68-17.00r.

Bockelmann, Victor G., to United States of America, Navy. Air-venting parachute. 3,727,863, Cl. 244-145.000.

Bockmann, August: *See—*
Rudolph, Hans; Trenczek, Gerhard; Bockmann, August; Prater, Klaus; and Gutsche, Walter, 3,728,142.

Bode, Klaus-Dieter; Schroeder, Josef; and Schellhammer, Carl-Wolfgang, to Farbenfabriken Bayer Aktiengesellschaft. Styryl compounds. 3,728,339, Cl. 260-240.00d.

Boder, Dieter, to Rheinmetall GmbH. Impulse transmitter for dynamic devices for testing pieces of ordnance. 3,727,455, Cl. 73-167.000.

Boegeman, Dwight E., to United States of America, Navy. Method of resolving multiple sweep ambiguities encountered in high resolution graphic recorders and the like. 3,728,734, Cl. 346-1.000.

Boehringer Ingelheim G.m.b.H.: *See—*
Freter, Kurt; Gotz, Manfred; Oliver, James T.; and Zeile, Karl, 3,728,460.

Boeing Company, The: *See—*
Adams, Lyle C., 3,728,595.

Bognar, Lewis L., to Corning Glass Works. Compression sagging of sheet glass. 3,728,097, Cl. 65-102.000.

Bohannon, Philip. Sectional convertible wig case. 3,728,003, Cl. 312-285.000.

Bohlman, Heino. Garden sprinkler hose. 3,727,845, Cl. 239-534.000.

Bohorfoush, Joseph G.: *See—*
Sayers, Robert S.; and Bohorfoush, Joseph G., 3,727,612.

Boissicat, Claude M. Dip handling apparatus. 3,727,757, Cl. 209-73.000.

Bojas, Edward J.: *See—*
Keith, Errol W.; Watson, Jack; and Bojas, Edward J., 3,727,402.

Bolles, Milton M., to Deering Milliken Research Corporation. Apparatus for the production of non-woven net fabrics. 3,728,195, Cl. 156-441.000.

Bonness, Donald A.: *See—*
Streater, August L.; and Bonness, Donald A., 3,727,706.

Bonsky, Elmer C.; and Curtis, Lawrence A., to T.A.D. Avanti Inc. Telephone answering system and apparatus including improved ring responsive circuitry for selectively connecting and isolating the system from the telephone line. 3,728,488, Cl. 179-6.00r.

Bonthelius, Bo Bengt Urban. Foldable yoke life preserver. 3,727,249, Cl. 9-312.000.

Booth, Llewellyn D.; and Hinze, Kenneth J., to Dow Chemical Company, The. Polyurethane compositions containing phenol-aldehyde resins and polyether polyols. 3,728,293, Cl. 260-17.200.

Borbat, Vladimir Fedorovich: *See—*
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,728,103.

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Borner, Peter: *See—*
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Borough, Howard C.; and Pontarelli, Donald A., to Bliss & Laughlin Industries, Incorporated, mesne. Encoded card employing fiber optic elements. 3,728,521, Cl. 235-61.20n.

Borowski, Kurt; and Kubitzek, Alfred, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus with liquid crystal voltage indicator. 3,727,527, Cl. 95-10.00r.

Bosch, Robert, G.m.b.H.: *See—*
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Links, Heinz, 3,727,595.
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Boston, Robert L., to GAF Corporation. Automatic roll-supplied copy material-feeding and cutting mechanism. 3,727,499, Cl. 83-205.000.

Bostwick, James L. Automatic brake slack. adjustor. 3,727,728, Cl. 188-79.50k.

Botos, Stephen J. Coarse and fine adjustment and positioning mechanisms. 3,727,471, Cl. 74-89.150.

Botwin, Leo; Chanzit, Lawrence; and Ruttenberg, Kenneth A., to United Aircraft Corporation. Phase interferometer radar. 3,728,727, Cl. 343-16.00r.

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Bowler, Lauren L.; and Harned, John L., to General Motors Corporation. Anti-lock brake control system. 3,727,992, Cl. 303-21.00p.

Bowman and Associates, Inc.: *See—*
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Bowman, George A., to Bowman and Associates, Inc. Process of making glass. 3,728,094, Cl. 65-27.000.

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Braner, Harold R.; Jasinski, William C.; Matsunaga, Douglas S.; and Valencia, Agapito, to Braner Engineering, Inc. Slitter having pivotal multiple spaced pairs of arbors. 3,727,503, Cl. 83-479.000.

Brauer, James S.: *See—*
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Braun, Curt, to Hunter Engineering Co. Method and apparatus for continuously processing strip. 3,727,820, Cl. 226-113.000.

Bredeson, Dean K.; and Slaby, Robert Kent, to French Oil Mill Machinery Company, The. Apparatus for treating elastomeric materials. 3,728,055, Cl. 425-84.000.

Breetvelt, Emile, to Intermenua (Proprietary) Limited. Relating to clamping means. 3,727,500, Cl. 83-375.000.

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Brent, William Donald, to Brent, W. D., Manufacturing Ltd. Live animal aircraft transport system. 3,727,581, Cl. 119-17.000.

Brewer, Lee M., to General Motors Corporation. High pressure steering system. 3,727,404, Cl. 60-430.000.

Brewster, Donald H. Livestock oiler. 3,727,586, Cl. 119-157.000.

Briar, John R., to General Motors Corporation. Centrifugally engaged coil clutch with Wright lock. 3,727,738, Cl. 192-105.0ce.

Brightman, Ben W.; and Clarke, Clarence C., to Whirlpool Corporation. Refrigerator control circuit. 3,727,419, Cl. 62-155.000.

Brill, Frank David, to Seeburg Corporation of Delaware, The. Apparatus and method for mixing particulate ingredients with a liquid. 3,727,891, Cl. 259-4.000.

Brille, Maurice; and Baguelin, Yves, to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem. Rotary-piston diesel engine superchargers. 3,727,399, Cl. 60-13.000.

Brinckman, Eric Maria: *See—*
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Jowett, John Bernard, 3,727,645.

Bristol-Myers Company: *See—*
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Brock, George W.; and Stephens, Raymond, to International Business Machines Corporation. Method of forming gaps for small magnetic heads. 3,727,303, Cl. 29-603.000.

Brock, Lynn S., to General Motors Corporation. Thermoelectrical switch. 3,728,659, Cl. 337-315.000.

Brocker, Bernard D., Jr., to Motorola, Inc. High speed master-slave flip-flop frequency divider. 3,728,561, Cl. 307-291.000.

Broermanq Arthur B., to Philhips Petroleum Company. Methods of making and using a chromatographic column comprising a flexible yarn is the solid support. 3,727,451, Cl. 73-23.100.

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Brown, Joseph L., to Brown Truck and Trailer Manufacturing Company. Furniture truck frame. 3,727,903, Cl. 269-17.000.

Brown, Robert A., to Electro Development Corporation. Reverse motion detector. 3,728,676, Cl. 340-70.000.

Brown, Robert D. Toothbrush holder. 3,727,748, Cl. 206-15.10c.

Brown, Robert G., to Bunn, B. H., Company. Elliptical gear drive for bundle tying machine. 3,727,959, Cl. 289-15.000.

Brown, Thomas A.; and Huber, Joseph B., to Kennametal Inc. Forming roll. 3,727,957, Cl. 287-53.00r.

Brown Truck and Trailer Manufacturing Company: *See—*
Brown, Joseph L., 3,727,903.

Brucher, Adolf; Gemein, Rudolf; and Holzer, Gerold, to Kraftwerk Union Aktiengesellschaft. Slide and support bearing for rotors of large turbine machines. 3,727,997, Cl. 308-160.000.

Bruckner Apparatebau GmbH: *See—*
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Brueck, Chris Marion. Drill tool adapter. 3,727,258, Cl. 15-93.00r.

Bruen, Charles P.; and Wamser, Christian A., to Allied Chemical Corporation. Method of recovering chromium and barium values from waste barium chromate. 3,728,273, Cl. 252-182.000.

Brunswick Corporation, The: *See—*
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BTI Ltd.: *See—*
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Buccicone, Velio S., to Bucciconi Engineering Co., Inc. Scissors-type hoist mechanism. 3,727,780, Cl. 214-95.00r.

Bucciconi Engineering Co., Inc.: *See—*
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Buchanan, Dwight D. Holder for tape dispensers. 3,727,868, Cl. 248-309.000.

Buckingham, William T., to Foseco International Limited. Anti-piping composition for the production of metal ingots and castings. 3,728,102, Cl. 75-94.000.

Buckley, Norman A., to McGraw-Edison Company. Steam air type garment finisher. 3,727,811, Cl. 223-70.000.

Buckman, William Gordon; Sutherland, David C.; and Cooke, David W., to United States of America, Health, Education and Welfare. Thermoluminescence of sapphire. 3,728,543, Cl. 250-71.00r.

Buckwalter, Sanford L. Stud bolt puller and inserter. 3,727,491, Cl. 81-53.200.

Buese, George J., to Johnson & Johnson. Thermoplastic supportive structure. 3,728,206, Cl. 161-112.000.

Buettner, Carl F. Means for accurately measuring and monitoring liquid flows. 3,727,459, Cl. 73-205.00r.

Bulygin, Nikolai Vladimirovich; Vinogradov; Evgeny Alexandrovich; Gugel, Lev Genrikhovich; Dianov, Evgeny Mikhailovich; and Irisova, Natalia Alexandrovna. Open-type resonator. 3,728,640, Cl. 331-94.500.

Bundy, Gordon L., to Upjohn Company, The. 15-Methyl and 15-ethyl prostaglandin analogs. 3,728,382, Cl. 260-514.00d.

Bundy, Larry P., to Thiokol Chemical Corporation. Stabilized propellant compositions and methods for their preparation. 3,728,171, Cl. 149-19.000.

Bunker, Richard D., to Dyna-Flex Corporation. Exposed printing plate washer. 3,727,536, Cl. 95-98.000.

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Burany, Janos; Csovak, Erno; Gulyas, Gabor; Nemeth, Jozsef; Van, Ivan; Vollak, Andor; and Erdosi, Jozsef, to Gepipari Technologiai Intezet. Process and an equipment for the plastic forming or shaping and simultaneous chip-free chopping of metal bars and wies. 3,727,253, Cl. 10-86.00f.

Burckhardt, Manfred H.; Wupper, Hans-Herbert; and Worbis, Siegfried, to Daimler-Benz Aktiengesellschaft. Coil compression spring. 3,727,902, Cl. 267-180.000.

Burge, Joseph C., to General Electric Company. Bolt retainer and compressor employing same. 3,727,660, Cl. 151-69.000.

Burger, Karl Heinz: *See—*
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Burke, Edward F., Jr., to Polaroid Corporation. Thermally responsive flash lamp sequencing apparatus. 3,728,069, Cl. 431-93.000.

Burke, George K.; and Raines, Kenneth, to Burron Medical Products, Inc. Method of making syringe and needle adapter assembly by ultrasonic bonding. 3,728,184, Cl. 156-73.000.

Burkhardt, Horst: *See—*
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Burnett, James H., to Edwards Company, Inc. Fire detector stabilizer circuit. 3,728,703, Cl. 340-237.00s.

Burris, Glenn A.; and Lares, Joseph P. Metering valve. 3,727,882, Cl. 251-209.000.

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Burt, James Gordon, to Du Pont de Nemours, E. I., and Company. Mixtures of 1,1,2-trichloro-1,2,2-trifluoroethane, ethanol and acetone and a ternary azeotrope thereof. 3,728,268, Cl. 252-170.000.

Burton, James A., to AMF Incorporated. Writing apparatus for use with galvanometer devices. 3,728,735, Cl. 346-139.00c.

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Butler, Kenneth; Carroll, Ronnie D.; and Hamanaka, Ernest S., to Pfizer Inc. 6-(1-Carboxycycloalkylcarboxamido)penicillanic acid, derivatives and salts thereof. 3,728,334, Cl. 260-239.100.

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Cadonati, Gaimpiero. Method for reeled yarn dyeing and apparatus for carrying the method into effect. 3,728,077, Cl. 8-155.100.

Cain, Robert L., to American Gage & Manufacturing Co., The, mesne. Release mechanism for ratchet-type power unit. 3,727,886, Cl. 254-164.000.

Caldwell, John R.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Hot melt adhesive blends of poly(tetramethylene) terephthalate and polystyrene or polystyrene copolymers. 3,728,212, Cl. 161-182.000.

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Camp, Nat. Handle clamp. 3,727,265, Cl. 16-125.000.

Campbell, James R. Method of fabricating a spherical bearing. 3,727,280, Cl. 29-149.50b.

Campman, James P., to Vidar Laboratories, Inc. Capacitor microphone. 3,728,642, Cl. 332-2.000.

Canadian Marconi Company: *See—*
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Cannan, Bernard M., to Servicemaster Industries Inc. Method of shampooing carpet on location. 3,728,075, Cl. 8-147.000.

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Cappetti, Ilio; Melindo, Flavio; and Perucca, Giovanni, to Centro Studi E Laboratori Telecomunicazioni S.p.A. Traffic concentrator for telecommunication system with tree structure. 3,728,492, Cl. 179-18.0fc.

Carabbio, Robert M.: *See—*
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Carlson, Carl J.; and Horne, Samuel E., Jr., to Goodrich, B. F., Company. Polymerization of conjugated polyolefins. 3,728,325, Cl. 260-94.300.

Carmichael, Keith Stewart, to Du Pont de Nemours, E. I., and Company. Noneverting bottom for thermoplastic bottles. 3,727,783, Cl. 215-1.00c.

Carothers, Charles H. Method and apparatus for ecological recycling of waste products to produce fertilizer and garden plant nutrients. 3,728,254, Cl. 210-7.000.

Carp, Ralph Wolf: *See—*
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Carrier, Gerald B.; and Flannery, James E., to Corning Glass Works. Durable borosilicate opal glasses. 3,728,139, Cl. 106-54.000.

Carroll, Felix P.; and Green, Harold A., to Air Products and Chemicils, Inc. Catalyst composition for polyurethane foam. 3,728,291, Cl. 260-2.5ac.

Carroll, Ronnie D.: *See—*
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Case, J. I., Company: *See—*
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Casensky, Bohuslav; Machacek, Jiri; and Vit, Jaroslav. Method of producing sodium aluminum hydrides. 3,728,272, Cl. 252-188.000.

Casey, Gerald F., to Fema Corporation. Adjustable non-linear spring and spring suspension system. 3,727,900, Cl. 267-160.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
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Caule, Elmer J., to Olin Corporation. Method of producing a flexible laminate copper circuit. 3,728,177, Cl. 156-3.000.

Caule, Elmer J., to Olin Corporation. Method of producing flexible copper laminate for printed circuits. 3,728,178, Cl. 156-3.000.

Caulton, Martin, to RCA Corporation. Semiconductor assembly. 3,728,589, Cl. 317-234.00r.

Cella, John Anthony; York, Thomas Oliver; and Schmitt, William Howard, to Alberto-Culver Company. High-foaming liquid detergent compositions. 3,728,265, Cl. 252-90.000.

Centre National de Recherches Metallurgiques: *See—*
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Centro Sperimentale Metallurgico S.p.A.: *See—*
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Chatourel, Pierre Rene; and Lefebvre, Jean Henri, to Regie Nationale des Usines Renault. Low-pressure chill-casting devices. 3,727,674, Cl. 164-306.000.
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Cheng, Tai Chun; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Process for the polymerization of conjugated dienes. 3,728,324, Cl. 260-94.20t.
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Choules, Marcel Henry, to Russell Finex Limited. Vibratory apparatus. 3,727,470, Cl. 74-87.000.
Christen, Paul. Trench shoring, shuttering and sheeting system. 3,727,413, Cl. 61-41.00a.
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Christian, Huni, to Mazereau, Michel Claude Jean. Closure device for plastic bags. 3,727,829, Cl. 229-54.00r.
Christman, Stanley A., to Esso Production Research Company. Composition for drilling wells and method for preparing and using same. 3,728,259, Cl. 252-8.50c.
Chu, Ta-Shing, to Bell Telephone Laboratories, Incorporated. Apparatus for transforming nonorthogonal elliptically polarized waves into orthogonal linearly polarized waves. 3,728,643, Cl. 333-21.00a.
Chu, Ta-Shing, to Bell Telephone Laboratories, Incorporated. Polarization transformation apparatus. 3,728,644, Cl. 333-21.00a.
Churla, John J., to Thomas & Betts Corporation. Wire terminating device. 3,728,669, Cl. 339-257.000.
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Claesson, Georg; and Battini, Renato, to RIV-SKF Officine di Villar Perosa S.p.A. Heat treatment apparatus. 3,727,896, Cl. 266-4.00r.
Clampitt, Richard L.; and Hessert, James E., to Phillips Petroleum Company. Aqueous gels and uses thereof. 3,727,687, Cl. 166-274.000.
Clampitt, Richard L., to Phillips Petroleum Company. Hydraulic fracturing method. 3,727,688, Cl. 166-283.000.
Clampitt, Richard L., to Phillips Petroleum Company. Hydraulic fracturing. 3,727,689, Cl. 166-283.000.
Clark, Cecil M. Meat tenderizing machine. 3,727,267, Cl. 17-25.000.
Clark, Hubert M.; and Drutchas, Gilbert H., to TRW Inc. Power steering pump. 3,728,046, Cl. 417-79.000.
Clark, William E.: *See—*
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Clausing, Challiss I.; and Pokorny, Frank J., to I-T-E Imperial Corporation. Shock-proof arc chute for high voltage circuit breaker with metallic arc plates having off-set lines of openings. 3,728,503, Cl. 200-144.00r.
Clay, Robert E. Method of preparing architectural and engineering drawings. 3,728,190, Cl. 156-235.000.
Cleij, Jan: *See—*
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Cleland, Luther A., Jr.; and Harmon, Albert D., to Maremont Corporation. Device and method for detecting and withdrawing a predetermined length of yarn. 3,728,550, Cl. 250-219.00s.
Cleland, William Pettigrew, to British Steel Corporation. Magnetic sorting and piling bank. 3,727,758, Cl. 209-74.000.
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Clermont Vinas, Maria Teresa. Device for the wet treatment of packed and similar textile materials. 3,727,436, Cl. 68-189.000.
Clitheroe, Jay B.; and Lacy, Forrest H., Jr., to Anlin Company of New Jersey, The. Method for processing copper values. 3,728,430, Cl. 423-26.000.
Cobb, James Campbell. Containers. 3,727,803, Cl. 222-215.000.
Cobbs, Walter H., Jr.; Dunn, Donald; and Soukup, Victor G., to Cincinnati Milicron. Impact-resistant rigid polyurethane foam compositions and process of manufacture. 3,728,288, Cl. 260-2.5bd.
Cochran, William H., II. Textile product and process for making same. 3,728,204, Cl. 161-66.000.
Coffield, Thomas Hunter, to Ethyl Corporation. Cobalt recovery. 3,728,104, Cl. 75-101.0be.
Cofield, William W., to Transcontinental Gas Pipe Line Corporation. Production of synthetic pipeline gas. 3,728,093, Cl. 48-190.000.
Coilform Company: *See—*
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Colby, Daniel E.; Rogers, Philip E.; and Sliwinski, Frederick J., to McCord Corporation, mesne. Slush molding process. 3,728,429, Cl. 264-302.000.
Cole Resedevel Corporation: *See—*
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Cole, William: *See—*
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Coleman, Michael G., to Motorola, Inc. Electro optical device comprising a unitary photoemitting junction and a photosensitive body portion having highly doped semiconductor electrodes. 3,728,593, Cl. 317-235.00r.
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Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,728,385.
Coller, James Ray, to AMP Incorporated. Method and machine for forming and inserting workpieces in an apertured workpiece holder. 3,727,294, Cl. 29-429.000.
Collins, Delmas E., to Jones-Zylon, Inc. Dry closet urinal. 3,727,244, Cl. 4-110.000.
Collins Radio Company: *See—*
Fuller, Ray C.; Phillips, Gary D.; and Simone, Richard B., 3,728,681.
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Cook, Elton S.; and Tanaka, Kinji, to Stanley Drug Products, Inc. Method and compositions for inducing resistance to bacterial infections. 3,728,444, Cl. 424-3.500.
Cook, Lucine H., Sr. Organ tone control. 3,727,510, Cl. 84-453.000.
Cook, Melvin A.; Udy, Lex L.; and Funk, Albert G., to Intermountain Research & Engineering Co., Inc. Dense explosive slurry compositions of high energy containing a gum mixture. 3,728,173, Cl. 149-21.000.
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Cooley, Austin C., to Eastman Kodak Company. Electrolytic method for recovering metal from solution. 3,728,235, Cl. 204-109.000.
Cooley, Austin C. High current density electrolytic cell. 3,728,244, Cl. 204-269.000.
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Cooper, William W., IV, to Abcor, Inc. Cross flow capillary dialyzer. 3,728,256, Cl. 210-22.000.
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Cote', Paul T., to General Electric Company. Photoflash lamp array having flash-actuated switches. 3,728,068, Cl. 431-95.000.
Cott, Georges Emanuel, to Reliure Industrielle S.T.D. Binding for perforated leaves made up of a single plastic piece. 3,728,036, Cl. 402-31.000.
Counsell, Raymond E.; and Mehta, Persis Pocha, to University of California, The Regents of the. Radioiodinated quinoline derivatives. 3,728,351, Cl. 260-288.00a.
Courty, Albert, to Thomson-CSF. Ultrasonic systems for carrying out flow measurements in fluids. 3,727,454, Cl. 73-194.00a.
CPC International Inc.: *See—*
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Crabbe, Pierre; and Fried, John H., to Syntex Corporation. Preparation of 17alpha-propadienyl steroids. 3,728,364, Cl. 260-397.400.
Craig, William Allan, to Imperial Chemical Industries Limited. Slurry explosives. 3,728,175, Cl. 149-29.000.
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Cranston, Benjamin Howell. Explosive bonding of workpieces. 3,727,296, Cl. 29-470.100.
Cranston Machinery Co., Inc.: *See—*
Cranston, Albert E., III; and Lewis, Charles B., 3,727,965.
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Crisp, Harold A.; Oughton, John F.; and Pearce, Graham A., to Glaxo Laboratories Limited. Process for the purification of cephalexin. 3,728,341, Cl. 260-243.00c.
Cristiani, Athos, to AMF Incorporated. Pneumatic separator for a stream of cut tobacco. 3,727,755, Cl. 209-45.000.
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Cronan, Philip J. Dual compartment spray container. 3,727,797, Cl. 222-80.000.
Cronin, Timothy Henry, to Pfizer Inc. Preparation of quinoxaline-2-carboxamide derivatives. 3,728,345, Cl. 260-250.00r.
Cross, Alexander D.; and Edwards, John A., to Syntex Corporation. (lower) Alkoxytetrahydropyranyl ethers and 5', 6'-dihydro-2H-pyran-4'-yl ethers of 7β-methyl-Δ⁴-androstanes. 3,728,336, Cl. 260-239.55r.
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Cummens, Joseph R.; and Heiberger, Francis E., to Danly Machine Corporation. Servo motor controlled transfer system for automatic press line. 3,728,597, Cl. 318-85.000.
Cunningham, Ernest R., to Illinois Tool Works Inc. Container carrier. 3,727,754, Cl. 206-65.00e.
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Dai Nihon Bungu Kabushiki Kaisha Calso, a/t/a Japan Stationery Co., Ltd., The: *See—*
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Damwyk, Ariens. Treatment of bananas with calcium hydrated lime and product thereof. 3,728,131, Cl. 99-103.000.
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Daspit, Alex D. Welding power source. 3,728,516, Cl. 219-131.00r.

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Davich, Michael, to General Electric Company. Thrust bearing system. 3,727,996, Cl. 308-132.000.

Davidson, Jimmy Lee; and Mason, Donald R., to Radiation Incorporated. Method of etching silicon crystals. 3,728,179, Cl. 156-8.000.

Davies, Philip H., to Bawden, Peter, Drilling Services Ltd. Off shore drilling platform construction. 3,727,414, Cl. 61-46.500.

Davis, Charles H.; and Borczyk, Lech Stanislaw, to Anaconda Wire and Cable Company. Apparatus for separating and shearing a cable strand. 3,727,497, Cl. 83-167.000.

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De Angeles, Robert Marion; and Zbylut, Dennis. Dental tool. 3,727,314, Cl. 32-41.000.

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De Graaf, Wilhelms Polycarpus; and Tielemans, Peter Andreas Waltherus, to U.S. Philips Corporation. Device for flashing combustion flash bulbs one after the other. 3,728,067, Cl. 431-95.000.

De Hoff, Edward J.; and Schenk, Donald E., to General Motors Corporation. Pressure proportioning control valve. 3,727,991, Cl. 303-6.00c.

De Jesus, Charles; Lane, William P.; and Wareham, Richard R., to Polaroid Corporation. Combination flare baffle and light seal for a reflex camera. 3,727,529, Cl. 95-42.000.

de Putter, Warner Jan, to Industriele Onderneming Wavin N.V. Apparatus for deforming a plastic pipe. 3,728,059, Cl. 425-155.000.

De Rugeris, John. Electromechanical energy conversion device. 3,728,564, Cl. 310-168.000.

Dean, Weibley J.: *See—*
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Deardorff, Donald L.; Chesler, Edwin T.; and Fath, Joseph L., to Teknor Apex Company. Diacyl peroxides. 3,728,402, Cl. 260-610.00d.

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Degawa, Jiro; and Takeuchi, Osamu. Device for making phosphor screen for color picture tubes. 3,727,525, Cl. 95-1.00r.

Delmage, Norman E. Camping assemblies. 3,727,970, Cl. 296-23.00r.

Dennis, Charles L.; and Zemanek, Joseph, Jr., to Mobil Oil Corporation. Method and apparatus for logging the characteristics of materials forming the walls of a borehole. 3,728,672, Cl. 340-15.5ds.

Dennis, James Arnold: *See—*
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Deschene, Clement F.: *See—*
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Deutscher, Hans-Christian; and Bauer, Kurt, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Windshield wiper assembly for headlamp. 3,727,262, Cl. 15-250.230.

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Devine, Walter B., to Esso Research and Engineering Company. Icebreaking cargo vessel. 3,727,571, Cl. 114-41.000.

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Diffenderfer, Walter L.; and McFarland, Frederick R., to K-D Manufacturing Company. Disc brake pad spreader. 3,727,490, Cl. 81-3.00k.

Difranco, Jack E. Memorandum dispensing device at preselected intervals. 3,727,794, Cl. 221-3.000.

Dill, Ernest F. Toy gun. 3,727,344, Cl. 46-175.000.

Dill, Onnie R. Vibratory massaging device. 3,727,607, Cl. 128-33.000.

Dillehay, David R.; Krackenberger, Herman F.; and Havron, Howard C., to Thiokol Chemical Corporation. Product and process for producing a container cured illuminant composition. 3,728,172, Cl. 149-19.000.

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Dobransky, Robert P.; Froehlich, Frederick B.; Halter, Bernard J.; and Middleton, William H., to International Business Machines Corporation. Means for equalizing the loading characteristics of vacuum columns. 3,727,859, Cl. 242-182.000.

Dobson, Thomas A.; and Rochefort, J Guy, to American Home Products Corporation. Compositions for and method of treating inflammatory conditions. 3,728,349, Cl. 424-285.000.

Doittau, Francois-Xavier: *See—*
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Snider, Philip A., 3,728,052.

Doughty, Robert L., to Monsanto Company. Package for holding pressurized fluent material. 3,727,782, Cl. 215-1.00c.

Douglas, Alec T.; Thomas, Haydon C.; and Keen, Harry J., to Colt Industries Operating Corp., mesne. Electronic measuring system. 3,728,626, Cl. 324-99.00d.

Douros, John D., Jr.; and Kerst, Al Fred, to Gates Rubber Company, The. Dialuric acid compounds as antibacterial and antifungal agents. 3,728,453, Cl. 424-251.000.

Douros, John D., Jr.; and Kerst, Al Fred, to Gates Rubber Company, The. Alloxan compounds as antibacterial and antifungal agents. 3,728,454, Cl. 424-251.000.

Douros, John D., Jr.; and Kerst, Al F., to Gates Rubber Company, The. Use of violuric acid as a fungicide or bactericide. 3,728,461, Cl. 424-251.000.

Douty, Donald L., to United States Steel Corporation. Can end with bonded seal-slide. 3,727,809, Cl. 222-541.000.

Douty, Donald L., to United States Steel Corporation. Can end with pivoted bonded seal slide. 3,727,810, Cl. 222-541.000.

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Schrader, Paul G., 3,728,425.

Downey, Dixon P. Eyeglasses with retainer. 3,728,012, Cl. 351-157.000.

Downey, Holmes A., to Reliance Electric Company. Shaft coupling. 3,727,429, Cl. 64-11.00r.

Downing, John D. Greaseless baked donut mold. 3,727,875, Cl. 249-121.000.

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Doyle, William Carter, Jr., to Gulf Research & Development Company. 3-Mercapto-2-chloropropyl-N,N-dihydrocarbyl thiolcarbamates. 3,728,371, Cl. 260-455.00a.

Drake, Curry A. Replacement refrigerator compressor bracket. 3,727,866, Cl. 248-16.000.

Dranoff, Samuel. Grasping device. 3,727,963, Cl. 294-23.000.

Dresser, Allan W.; and Reuteler, Johann F., to Colt Industries Operating Corporation. Servo system having high resolution D/A. 3,728,718, Cl. 340-347.0da.

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Druss, Barry Lewis; and Williams, Kendall Scott, to Chimera Research and Development, Inc. Ski binding. 3,727,932, Cl. 280-11.35k.

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Duc, Francois. Movable apparatus for use in picking fruit. 3,727,720, Cl. 182-38.000.

Duchane, David V., to Kimberly-Clark Corporation. Soft, drapable nonwoven material. 3,727,615, Cl. 128-290.00w.

Dudzik, Leonard J., to Unarco Industries, Inc. Sprinkler attachment for racks. 3,727,694, Cl. 169-2.00r.

Duerr, Bruno A., to General Motors Corporation. Power transmission. 3,727,485, Cl. 74-782.000.

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Espy, Herbert H., to Hercules Incorporated. Aminopolyamide--acrylamide--polyaldehyde resins employing an alpha, beta-unsaturated monobasic carboxylic acid or ester to make the aminopolyamide and their utility as wet and dry strengthening agents in papermakng. 3,728,215, Cl. 162-167.000.
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Fleissner, Heinz, to Vepa AG. Process for the heat-setting of padded and printed endless synthetic filament groups and top slivers. 3,728,076, Cl. 8-149.100.

Flider, Frank S., to Justrite Manufacturing Company. Safety container for inflammables. 3,727,807, Cl. 222-469.000.

Floessel, Dieter; and Clerc, Henri, to Aktiengesellschaft Brown, Boveri & Cie. Pressure-gas actuated electrical circuit breaker. 3,728,507, Cl. 200-148.00d.

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Forster, Hans-Joachim M.; Von Koch, Arwed; and Gaus, Hermann, to Daimler-Benz Aktiengesellschaft. Pressure control installation for hydraulically shifted automatic transmissions, especially for motor vehicles. 3,727,487, Cl. 74-865.000.

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Foster, Edson P. Felting needle. 3,727,276, Cl. 28-4.00n.

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Frazeur, Dean Russell; and Huston, Robert Bruce, to Grain Processing Corporation. Protein and method of extracting same from soybeans employing reverse osmosis. 3,728,327, Cl. 260-123.500.

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Freis, Richard E.; and Culbertson, Billy M., to Ashland Oil, Inc. Acrylamide of methacrylamide monomer with N-substituted aminimide residues. 3,728,387, Cl. 260-561.00h.

French Oil Mill Machinery Company, The: *See*—
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Freshwater, Ben N.; and Goodrich, Robert C., to GAF Corporation. Textile dye carrier emulsifier composition and process for dyeing polyesters therewith. 3,728,078, Cl. 8-174.000.

Freter, Kurt; Gotz, Manfred; Oliver, James T.; and Zeile, Karl, to Boehringer Ingelheim G.m.b.H. Anorectic pharmaceutical composition containing certain-(methylamino-methyl)-alpha-(4'-halo-phenyl)-benzyl alcohols as active ingredients. 3,728,460, Cl. 424-30.000.

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Frey, William G., to Thomas & Betts Corporation. Electrical connector. 3,728,665, Cl. 339-97.00c.

Freyermuth, Harlan B.; and Field, Nathan D., to GAF Corporation. Light sensitive esters of polyvinyl alcohol. 3,728,322, Cl. 260-91.3va.

Fricker, David C.; and Whittaker, Thomas F., to ECC Corporation. Trigger diode controlled motor starting system. 3,728,601, Cl. 318-221.00e.

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Goldberg, Louis. Plier-type tool for orthodontists. 3,727,316, Cl. 32-66.000.

Golden, Darrell R.; and McWhorter, Jack A., to American Beef Packers, Inc. Package and method for freshly cut meat. 3,728,135, Cl. 99-174.000.

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Goodbary, Edgar R.; and Thompson, James E., to Unit Rig & Equipment Company. Vehicle wheel suspension and mounting means. 3,727,938, Cl. 280-96.200.

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Gregory, Gerrett W. Pop-top can re-sealer. 3,727,787, Cl. 220-25.000.

Gregory, Nicholas. Apparent wind indicator. 3,727,457, Cl. 73-188.000.

Greiner, Harry M.; and Langer, Karl, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for the tilting of the folding blade of a folding-blade cylinder. 3,727,909, Cl. 270-71.000.

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Griffiths, Leonard B., to Mallory, P. R., & Co. Inc. Method of producing chill cast particulate composites. 3,728,162, Cl. 148-3.000.

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Groen, Siemen H.; Deumens, Johannes J. M.; and Stijfs, Petrus A. M. J., to Stamicarbon N.V. Preparation of C-substituted piperidine. 3,728,353, Cl. 260-293.520.
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Grundmann, Volker R.; and Floyd, Larry K., to New Britain Machine Company, The. Plastic injection molding machine safety mechanism. 3,728,057, Cl. 425-136.000.
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Harschel, Jonas C. Plastic container for dispensing measured quantities and reducing height of container as contents dispensed. 3,727,798, Cl. 222-87.000.

Hart, Don Rex, to Harpad Company. Cow parlor safety adjustment. 3,727,585, Cl. 119-96.000.

Hart, Frederick Harry; and McFegan, William, to Pilkington Brothers Limited. Method and apparatus for electrically welding a double walled glazing unit. 3,728,096, Cl. 65-40.000.

Hartley, Ezra Dale. Accelerometer. 3,727,465, Cl. 73-492.000.

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Hearn, Daniel P., to Atlantic Richfield Company. Synchronized period measuring system. 3,728,613, Cl. 324-.50r.

Hearn, Daniel P., to Atlantic Richfield Company. Optical magnetometer using a depumping signal formed by frequency modulating the output of a variable frequency oscillator with two alternating fixed frequency oscillators. 3,728,614, Cl. 324-.50r.

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Heijenbrok, Martinus Gerard Jens; and Van Herwijnen, Arend, to U.S. Philips Corporation. Method of manufacturing aluminum electrode foil for electrolytic capacitors. 3,728,237, Cl. 204-129.750.

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Heins, John L. Transmission line fault indicator and locator utilizing variable frequency source coupled to one end of line. 3,728,620, Cl. 324-52.000.

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Heinz, David M., to North American Rockwell Corporation. Bubble domain system. 3,728,697, Cl. 340-174.0tf.

Helbig, Walter Allen, Sr., to RCA Corporation. Computer input-output chaining system. 3,728,682, Cl. 340-172.500.

Helden, Robert Van; Kohll, Charles F.; and Verbrugge, Pieter A., to Shell Oil Company. Olefin disproportionation. 3,728,414, Cl. 260-683.00d.

Heling, Wilhelm, to Freudenberg, Carl. Non-woven fabric. 3,728,207, Cl. 161-151.000.

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Hengesbach, Robert W. Multiple jet fluid sprinkling, spraying and diffusing device. 3,727,841, Cl. 239-145.000.

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Henry, Russell Alger, Jr., to Deere & Company. Apparatus for finishing patterns and core boxes. 3,727,680, Cl. 165-119.000.

Hensler, Paul, to Porsche, Dr. h.c.F., K.G., Firma. Device for precipitating fuel the vapor discharging from the fuel supply of an internal combustion engine. 3,727,597, Cl. 123-136.000.

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Herpich, William A.; and Chaney, Donal W., to Peabody Galion Corporation. Rear loading refuse vehicle. 3,727,779, Cl. 214-83.300.

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Hoffman, John T. Drill dispensing container. 3,727,771, Cl. 211-69.000.

Hoffmann, Alfred; and Surbach, Erich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for making a dental appliance. 3,727,299, Cl. 29-472.700.

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Holbrook, Legrand K., to Medical Development Corporation. Fluid container structure having mutually cooperable port connections. 3,727,788, Cl. 220-44.00r.

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Kay, Nicholas L.: *See—*
Hass, Robert H.; and Kay, Nicholas L., 3,728,250.

Keady, Frederick D., to Weatherhead Company, The. Emergency bypass for brake pressure control. 3,727,989, Cl. 303-6.00c.

Kearns, Robert W., to Windshield wiper control. . 3,728,603, Cl. 318-443.000.

Keen, Harry J.: *See—*
Douglas, Alec T.; Thomas, Haydon C.; and Keen, Harry J., 3,728,626.

Keenan, William Francis: *See—*
Macker, John Arthur; and Keenan, William Francis, 3,728,693.

Keith, Errol W.; Watson, Jack; and Bojas, Edward J., to Eaton Corporation. Hydrostatic transmission speed and steering control system. 3,727,402, Cl. 60-444.000.

Kelemencky, Monroe R.: *See—*
Scott, Harold W.; and Kelemencky, Monroe R., 3,728,639.

Keller, Frederick C.: *See—*
Baus, Ammon; and Keller, Frederick C., 3,728,202.

Keller, Heinrich: *See—*
Kaufhold, Norbert; Konig, Klaus; Keller, Heinrich; De Graaf, Jan G.; Blankenzee, Johan; Bakker, Hans; and Plettenburg, Carolus, 3,727,862.

Keller, Siegfried, to Werkzeuzmaschinenfabrik Oerlikon-Buhrle AG. Automatic load dependent compressed air brake system. 3,727,994, Cl. 303-23.000.

Kelley, Archibald P.; Norman, Leslie W.; and Thompson, Walter H., Jr., to Garrett Corporation, The. Hypersonic aircraft engine and fuel injection system therefor. 3,727,409, Cl. 60-270.000.

Kelley, Arnold E.; Reeg, Cloyd P.; Wood, Frederick C.; and Cheadle, George D., to Union Oil Company of California. Gasoline manufacture by hydrofining, hydrocracking and catalytic cracking of heavy feedstock. 3,728,251, Cl. 208-89.000.

Kelley, Fred W., Jr., to General Electric Company. Electric power apparatus comprising converter, LC filter, and voltage regulator arranged for highly accurate and stable response. 3,728,609, Cl. 321-10.000.

Kelly, Charles A.; and Pacifici, James G., to Eastman Kodak Company. 4,4-Bis(alkoxycarbonyl)benzoin ethers. 3,728,377, Cl. 260-473.00r.

Kemmethmueller, Roland, to American Waagner-Biro Company, Inc. Indirectly heat exchanging plural gas streams for dry quenching hot coke and drying coal. 3,728,230, Cl. 201-39.000.

Kendall Company, The: *See—*
Marshall, Preston F.; and Kendall Company, The, 3,727,270.

Kennametal Inc.: *See—*
Brown, Thomas A.; and Huber, Joseph B., 3,727,957.

Kennecott Copper Corporation: *See—*
Skarbo, Roald R., 3,728,105.

Kennedy, William S.: *See—*
Adler, Alan J.; and Kennedy, William S., 3,727,708.

Kenney, Edward J.: *See—*
Sundby, Bjorn; Kenney, Edward J.; and Wixon, Harold E., 3,728,385.

Kenyon, Nazar P., to Parke, Davis & Company. Vapor guard viscometer. 3,727,452, Cl. 73-59.000.

Kershaw, Samuel L.: *See—*
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Kerst, Al F.: *See—*
Douros, John D., Jr.; and Kerst, Al F., 3,728,461.

Kerst, Al Fred: *See—*
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Douros, John D., Jr.; and Kerst, Al Fred, 3,728,454.

Kervalishvili, Nikolai Arsenovich: *See—*
Barkhudarov, Eduard Mikhailovich; Kervalishvili, Nikolai Arsenovich; and Kortkhondzhia, Vladimir Parmenovich, 3,728,246.

Kesling, Keith K., to General Motors Corporation. Ice flaking machine for domestic refrigerators. 3,727,425, Cl. 62-346.000.

Kesling, Keith K., to General Motors Corporation. Ice making device. 3,727,426, Cl. 62-346.000.

Keyser, Lewis R., to Price Brothers Company. Core device for void forming and gasket support in a mold wall. 3,727,876, Cl. 249-184.000.

Kidd, Earl H.: *See—*
Jespersen, Herbert A.; and Kidd, Earl H., 3,727,386.

Kidde, Walter, & Company, Inc., mesne: *See—*
Greenwald, Harry; and Lambiris, Christos, 3,727,440.

Kienast, Gerhard; Stutgens, Heribert; and Zander, Hans-Gunter, to Farbenfabriken Bayer Aktiengesellschaft. Production of titanyl sulfate solutions. 3,728,431, Cl. 423-69.000.

Kienzle Apparate G.m.b.H.: *See—*
Muller, Helmuth, 3,727,833.

Kiesel, Robert J.; Randall, David I.; Field, Nathan D.; and Rudoff, Stanley, to GAF Corporation. Reaction products of poly n-vinylpyrrolidone or poly n-vinyl pyrrolidones with alkyl side chains and organic secondary or tertiary amines. 3,728,319, Cl. 260-8.10r.

Kieserling, Th., & Albrecht: *See—*
Pauls, Kurt, 3,727,772.

Kigasawa, Kazuo; Hiiragi, Mineharu; and Wagatsuma, Nagatoshi, to Takeda Chemical Industries, Ltd., mesne. Azamorphinan compounds. 3,728,347, Cl. 260-250.00a.

Kim, Choong-Ki; and Snow, Edward H., to Fairchild Camera and Instrument Corporation. Charge coupled devices with continuous resistor electrode. 3,728,590, Cl. 317-235.00r.

Kimberly-Clark Corporation: *See—*
Duchane, David V., 3,727,615.
Thompson, Lenore E., 3,727,239.

Kimberly-Clark Corporation, mesne: *See—*
Wierzba, Anthony R.; and Spencer, Harvey J., 3,728,191.

Kimmett, James P. Electrical servicing tool. 3,727,286, Cl. 29-203.00h.

Kindle, Robert W.; Barnhart, Robert R.; and Paul, Philip T., to Uniroyal, Inc. Rubber-metal adhesion using halogenated quinone and resorcinol-aldehyde condensation product. 3,728,192, Cl. 156-306.000.

Kinley, John C.: *See—*
Kinley, John C.; and Jefferson, Walter C. (said Jefferson assor. to said), 3,727,692.

Kinley, John C.; and Jefferson, Walter C., said Jefferson assor. to said Kinley, John C. Liner removal apparatus. 3,727,692, Cl. 166-297.000.

Kinoshita, Hisashi, to Kabushiki Kaisha Fuji Tekkosho. Film winding machine. 3,727,853, Cl. 242-56.00a.

Kinoshita, Yoshitsugu: *See—*
Yumiyama, Seisuke; Kinoshita, Yoshitsugu; Kusunoki, Tadashi; Okada, Toshihiko; and Shimizu, Susumu, 3,727,580.

Kinsey, Lewis R. Prefabricated tapered columns. 3,727,363, Cl. 52-731.000.

Kirby, Gary N.: *See—*
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Kishi, Masanori: *See—*
Yano, Nobumitsu; Fukushima, Masao; Kishi, Masanori; and Nagayoshi, Fumio, 3,728,329.

Kitamura, Noriaki: *See—*
Nagumo, Ryoichi; and Kitamura, Noriaki, 3,727,625.

Kitch, Paul E., to Scott Paper Company. Torque control method and apparatus. 3,727,856, Cl. 242-75.500.

Kitsopoulos, Sotirios Constantine: *See—*
Herson, Robert Joseph; and Kitsopoulos, Sotirios Constantine, 3,728,562.

Kitt, Robert Alvin, to Lyall Electric, Inc. Flexible lampholder. 3,728,663, Cl. 339-60.00r.

Kjos, David M.; and Rowland, Chester A., Jr., to Allis-Chalmers Corporation. Apparatus for the method of liberating and removing fibrous material from a mineral ore. 3,727,849, Cl. 241-4.000.

Klar, Erhard; Petrosh, Algirdas E.; and Michael, Arthur B., to SCM Corporation. Process for forming a sintered briquette. 3,728,110, Cl. 75-211.000.

Klayum, Milton A.; and Pierzchala, Chester E., to Reliable Electric Company. Buried-type splice case. 3,728,467, Cl. 174-38.000.

Kleiber, Herbert: *See—*
Vogel, Horst; and Kleiber, Herbert, 3,728,728.

Kleimeyer, Vernon T.; and Schinner, Thomas J., to Cincinnati Time Recorder Company, Inc., The. Print hammer with integral pivotal print anvil. 3,727,548, Cl. 101-93.00c.

Klein, Harold C. Laryngoscope. 3,727,605, Cl. 128-11.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Picmaus, Ernst, 3,728,567.

Kleiner, Gersh Izrailevich: *See—*
Panina, Marina Alexeevna; Kleiner, Gersh Izrailevich; Strukov, Ivan Timofeevich; Zdobnova, Alexandra Fedorovna; Andreeva, Maria Kuzminicha; and Ryabova, Nonna Mikhailovna, 3,728,333.

Kleisa, Kurt: *See—*
Reerink, Wilhelm; Lehmann, Joachim; and Kleisa, Kurt, 3,728,229.

Klement, Johann, to Siemens-Electrogerate GmbH. Baking and roasting oven. 3,727,601, Cl. 126-21.001.

Kleykamp, Donald L.; Neroni, Peter J.; and Holden, Homer N., to Dayco Corporation. Hose construction. 3,727,949, Cl. 285-7.000.

Klinger, Karl Heinz, to Deutsche Gold- und Silber-Scheideanstaet vormals Roessler. Hydroxyphenylhydroxyalkylaminoalkyltheophyllines. 3,728,346, Cl. 260-256.000.

Klingler, Josef F., to Thermex, Inc., mesne. Disposable plastic thermometer. 3,727,461, Cl. 73-371.000.

Klir, Jiri; Svoboda, Bohumil; and Jaroslav, Bohac, to Vyzkumny ustav Strojirenske technologie a ekonomiky. Ski of shaped laminated material and method for its manufacture. 3,727,936, Cl. 280-11.131.

Knaack, Donald F., to Avisum Corporation. Perester free radical initiator for graft polymerization. 3,728,417, Cl. 260-878.000.

Knaack, Howard L., to Knaack Manufacturing Company. Padlock protection system. 3,727,438, Cl. 70-63.000.

Knaack Manufacturing Company: *See—*
Knaack, Howard L., 3,727,438.

Knapp, Heinrich, to Bosch, Robert, G.m.b.H. Temperature-responsive system for regulating the fuel mixture in air-cooled internal combustion engines. 3,727,598, Cl. 123-140.0mc.

Knecht, John E.: *See—*
Vermes, Roy E.; Nebeling, Robert L.; and Knecht, John E., 3,727,495.

Kniazuk, Michael, to Mercke & Co., Inc. Multiple dosage inoculator. 3,727,614, Cl. 128-218.00a.

Knickerbocker Company, The: *See—*
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Knight, Barry I.; Curcumelli-Rodostamo, Michael; and Von Schmeling, Bogislav, to Uniroyal, Inc. 2-(Substituted-methyl)-5,6-dihydro-1, 4-oxathiin-3-carboxamides. 3,728,357, Cl. 260-327.00p.

Kobayashi, Akira: *See—*
Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira, 3,728,459.

Kobayashi, Seihin; Torii, Michihiro; Jojima, Takehiko; and Okuda, Masanao, to Fuji Denki Kagaku Kabushiki Kaisha. Magnetic thin film plated wire memory. 3,728,698, Cl. 340-174.0bc.

Kobel, Janusz S.: *See—*
Senour, Donald A.; and Kobel, Janusz S., 3,728,625.

Kobler, Richard; and Fagan, William F., to McGraw-Edison Company. Signal control system for endless tape recorder. 3,728,494, Cl. 179-100.20s.

Koch, Hubert: *See—*
Bemelmann, Karl; and Koch, Hubert, 3,727,289.

Kodaira, Nobuhisa. Apparatus for heat treatment of synthetic yarn. 3,728,518, Cl. 219-326.000.

Koehn, James P.; and Bethune, Edwin M., to Under Sea Industries, Inc. Vest inflation/exhaust valve assembly. 3,727,250, Cl. 9-313.000.

Koehn, Richard R.: *See—*
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Koff, Irwin: *See—*
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Kohll, Charles F.: *See—*
Helden, Robert Van; Kohll, Charles F.; and Verbrugge, Pieter A., 3,728,414.

Kohn, Leo S.: *See—*
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Koivunen, Erkki A., to General Motors Corporation. Direct apply brake system. 3,727,986, Cl. 303-2.000.

Koizumi, Shun: *See—*
Kometani, Yutaka; Koizumi, Shun; Suzuki, Takesi; and Okuno, Chuzo, 3,728,303.

Kokin, Vitaly Kazimirovich: *See—*
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Kolesar, Paul M.; and Payne, Robert A., to Stewart-Warner Corporation. Non-flickering display system having multi-phase power source. 3,728,714, Cl. 340-334.000.

Kollsman Instrument Corporation: *See—*
Intraub, Julius, 3,727,463.

Koluch, Joseph S.; and Wittman, Ralph E., to Owens-Illinois, Inc. Article supply system. 3,727,756, Cl. 209-73.000.

Komatsu, Akira. Dynamic loudspeaker using wall as diaphragm. 3,728,497, Cl. 179-181.00w.

Komeda, Yoshiaki; and Nakagawa, Yunosuke, to Kao Soap Co., Ltd. Liquid detergent composition. 3,728,266, Cl. 252-95.000.

Koment, Edward J.: *See—*
McCune, Robert B.; and Koment, Edward J., 3,727,559.

Kometani, Yutaka; Koizumi, Shun; Suzuki, Takesi; and Okuno, Chuzo, to Daikin Kogyo Co., Ltd. Heat stabilized vinylidene fluoride polymer. 3,728,303, Cl. 260-45.70r.

Konig, Klaus: *See—*
Kaufhold, Norbert; Konig, Klaus; Keller, Heinrich; De Graaf, Jan G.; Blankenzee, Johan; Bakker, Hans; and Plettenburg, Carolus, 3,727,862.

Kortkhondzhia, Vladimir Parmenovich: *See—*
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Kosfeld, Milton M., to Fedders Corporation. Automatic temperature control for refrigeration compressor motor. 3,727,420, Cl. 62-196.000.

Kostas, Evans; and Schwarz, Robert E., to North American Rockwell Corporation. Reversible lockup for flexible printing plate. 3,727,551, Cl. 101-415.100.

Kostylev, Alexandr Dmitrievich: *See—*
Sudnishnikov, Boris Vasilievich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; Plavskikh, Vladimir Dmitrievich; Solomko, Viktor Eliseevich; and Reinsburg, Alexandr Mironovich, 3,727,701.

Kotler, Max; and Ravese, Frank E. Feed means for optical display device and control system therefor. 3,727,819, Cl. 226-46.000.

Kovacic, Charles R.; Schildgen, Robert M.; and Anderson, Hilding A., to SCM Corporation. Keyboard transmitter. 3,728,720, Cl. 340-365.000.

Kovalev, Igor Tikhonovich: *See—*
Krikorov, Vadim Sergeevich; Krasov, Vladimir Grigorievich; Sukhodaev, Boris Alexandrovich; Kokin, Vitaly Kazimirovich; Zhelninsky, Valentin Danilovich; Sukhanov, Nikolai Mefodievich; Leonov, Gennady Mikhailovich; Likholetov, Nikolai Ivanovich; Kovalev, Igo Tikhonovich; Gusev, Vladimir Vladimirovich; and Medvedev, Andrei Petrovich, 3,728,436.

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Alexandrov, Albert Ivanovich; Levin, Solomon Isaakovich; Chestnov, Valery Fedorovich; Kovaleva, Raisa Markovna; Birjukova, Tatyana Semenovna; Burko, Albert Ivanovich; and Naumov, Mikhail Grigorievich, 3,728,005.

Krackenberger, Herman F.: *See—*
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Kraftwerk Union Aktiengesellschaft: *See—*
Brucher, Adolf; Gemein, Rudolf; and Hölzer, Gerold, 3,727,997.

Kramer, W. Edward, to Gulf Research & Development Company. Oil-fired flame cultivator. 3,727,346, Cl. 47-1.440.

Krasov, Vladimir Grigorievich: *See—*
Krikorov, Vadim Sergeevich; Krasov, Vladimir Grigorievich; Sukhodaev, Boris Alexandrovich; Kokin, Vitaly Kazimirovich; Zhelninsky, Valentin Danilovich; Sukhanov, Nikolai Mefodievich; Leonov, Gennady Mikhailovich; Likholetov, Nikolai Ivanovich; Kovalev, Igo Tikhonovich; Gusev, Vladimir Vladimirovich; and Medvedev, Andrei Petrovich, 3,728,436.

Kraus, Constantine Raymond. Voicegram service. 3,728,486, Cl. 179-2.00r.

Kraus, Gerald M.; and Rupert, John G., to Honeywell, Inc. Gyro noise reduction. 3,727,466, Cl. 74-5.00r.

Kraus, Heinz: *See—*
Heidenhain, Johannes; Burkhardt, Horst; and Kraus, Heinz, 3,728,117.

Krauss-Maffei Aktiengesellschaft: *See—*
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Krebs, Charles J., to GTE Sylvania Incorporated. Radio receiver with wide dynamic range. 3,728,633, Cl. 325-303.000.

Kreimann, Herbert H., to Combustion Engineering Inc. Agitator for marble bed gas scrubber. 3,727,381, Cl. 55-233.000.

Krigbaum, Clarence A. Scrap rubber shredding device. 3,727,850, Cl. 241-159.000.

Krikorov, Vadim Sergeevich; Krasov, Vladimir Grigorievich; Sukhodaev, Boris Alexandrovich; Kokin, Vitaly Kazimirovich; Zhelninsky, Valentin Danilovich; Sukhanov, Nikolai Mefodievich; Leonov, Gennady Mikhailovich; Likholetov, Nikolai Ivanovich; Kovalev, Igo Tikhonovich; Gusev, Vladimir Vladimirovich; and Medvedev, Andrei Petrovich. Method of obtaining silicon monoxide. 3,728,436, Cl. 423-325.000.

Kronenwetter, Richard P.: *See—*
Bang, Mogens W.; and Kronenwetter, Richard P., 3,728,499.

Krueger, Harvey R., to Reynolds Products, Inc. Hot water supply system for brewer. 3,727,541, Cl. 99-307.000.

Kubicek, Donald H., to Phillips Petroleum Company. Spiro compounds. 3,728,404, Cl. 260-648.00d.

Kubicek, Donald H., to Phillips Petroleum Company. Process for the preparation of 1,2-bis(3-cyclohexen-1-yl)ethylene using base-treated olefin disproportionation catalysts. 3,728,407, Cl. 260-666.0py.

Kubitzek, Alfred: *See—*
Borowski, Kurt; and Kubitzek, Alfred, 3,727,527.

Kubota, Yasuharu, to Sony Corporation. Recording and reproducing color picture information. 3,728,477, Cl. 178-5.4cd.

Kuckhermann, Gustav, to Windmoller & Holscher. Tear-off apparatus for successively tearing off a length from the leading end of a moving flattened tubular web of material. 3,727,814, Cl. 225-100.000.

Kuehn, Erich, to Atlas Chemical Industries, Inc. Flame retardant and intumescent compositions. 3,728,138, Cl. 106-15.0fp.

Kuhle, Engelbert: *See—*
Zumach, Gerhard; Anders, Bertram; Grewe, Ferdinand; Kuhle, Engelbert; and Kaspers, Helmut, 3,728,456.

Kuhlow, Robert J., to General Motors Corporation. Semiconductor device mounting adapter. 3,728,584, Cl. 317-100.000.

Kuhn, Harry A., Jr.; and Foltz, James W., to Motorola, Inc. Micropower zero-crossing detector. 3,728,554, Cl. 307-233.000.

Kukolja, Stjepan, to Lilly, Eli, and Company. 3-Acyloxymethyl cephalosporins and method of preparation. 3,728,342, Cl. 260-243.00c.

Kulesa, Walter. Collapsible window scaffold. 3,727,721, Cl. 182-62.000.

Kullmann, Dieter; and Schmidt, Fritz, to Siemens Aktiengesellschaft. Expansion and contraction compensation arrangement for superconducting cables. 3,728,463, Cl. 174-12.00r.

Kumagai, Kiyoshi: *See—*
Uemura, Masao; Kumagai, Kiyoshi; and Toyama, Satoru, 3,727,960.

Kumakura, Toshimi; and Hosoyama, Takashi, to Kabushikikaisha Itoya. Manually operable roller type printing device. 3,727,549, Cl. 101-330.000.

Kuncic, Robert John, to CPC International Inc. Process for incubating Salmonella. 3,728,225, Cl. 195-96.000.

Kunstmann, Martin Paul; Williamson, Charles Brainerd, III; and Porter, John Norman, to American Cyanamid Company. Antibiotic BL617 and process for producing same. 3,728,448, Cl. 424-121.000.

Kuo, Lai Che, to Thomas & Betts Corporation. Multi-orificed electrical connector. 3,728,473, Cl. 174-84.00c.

Kupfer, David; Roscoe, Henry George; and Blickens, Donald Arthur, to American Cyanamid Company. Novel compositions of matter. 3,728,455, Cl. 424-270.000.

Kurebayashi, Tokuhiro: *See—*
Wakamatsu, Hisato; Fujinami, Hiroshi; and Kurebayashi, Tokuhiro, 3,727,488.

Kurimoto, Masashi: *See—*
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Kuris, Arthur, to Ultrasonic Systems, Inc. Ultrasonic apparatus for hair joining. 3,727,619, Cl. 132-56.000.

Kurkjian, Haig: *See—*
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Kuroi, Hisashi: *See—*
Nozawa, Shunichi; Kuroi, Hisashi; Hatada, Masamichi; and Fukuyama, Shunsaku, 3,728,578.

Kusunoki, Tadashi: *See—*
Yumiyama, Seisuke; Kinoshita, Yoshitsugu; Kusunoki, Tadashi; Okada, Toshihiko; and Shimizu, Susumu, 3,727,580.

Kuznetsov, Jury Nikolaevich. Method of dispersion analysis of suspensions and device for effecting the same. 3,728,028, Cl. 356-38.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
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Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
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La Flame, Frank E., to General Motors Corporation. Viscous fluid clutch. 3,727,735, Cl. 192-58.00b.

Lacy, Forrest H., Jr.: *See—*
Clitheroe, Jay B.; and Lacy, Forrest H., Jr., 3,728,430.

Lagerqvist, Roger: *See—*
Andersson, Anders; Lagerqvist, Roger; and Stenlund, Stig, 3,727,403.

Lahm, Heinrich, to Index-Werke KG Hahn & Tessky. Method and apparatus for setting a tool of a machine tool. 3,727,493, Cl. 82-1.00c.

Lakovits, John J.: *See—*
Myers, Lawrence R.; and Lakovits, John J., 3,727,516.

Lambiris, Christos: *See—*
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Landers, William A.: *See—*
Hawkey, Lynn J.; Landers, William A.; and Nesbitt, Frank E., 3,728,484.

Landis, Earle H. Handbag with break-away purse. 3,727,657, Cl. 150-35.000.

Lane, William P.: *See—*
De Jesus, Charles; Lane, William P.; and Wareham, Richard R., 3,727,529.

Lang, Walter: *See—*
Froehlich, Walter; and Lang, Walter, 3,728,481.

Lange, Peter J.; and Runnings, Harcourt G., to Red Dot Corporation. Shut-off valve. 3,727,879, Cl. 251-84.000.

Langecker, Erhard. Blowing machine for producing hollow bodies, particularly bottles. 3,728,063, Cl. 425-326.00b.

Langenstein & Schemann Aktiengesellschaft: *See—*
Hassel, Harald, 3,727,519.

Langer, Karl: *See—*
Greiner, Harry M.; and Langer, Karl, 3,727,909.

Langlands, Ian H., to National Sea Products Limited. Process and apparatus for shaping frozen flesh. 3,728,136, Cl. 99-194.000.

Lard, Edwin W., to Grace, W. R., & Co. Curable liquid polyene-polythiol compositions containing acrylic acid copolymers. 3,728,240, Cl. 204-159.160.

Lares, Joseph P.: *See—*
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Larribaut, Rene: *See—*
Maxime, Jacques; and Larribaut, Rene, 3,727,514.

Larson, Willis A.; and Tell, Stephen R., to Magic Dot, Inc. Touch sensitive electronic switch. 3,728,501, Cl. 200-52.000.

Larsson, Sune Torsten: *See—*
Hyden, Victor Holger; and Larsson, Sune Torsten, 3,727,602.

Lassig, Harry. Fully automatic apparatus for loading containers with single pieces assembled in sheet-wrapper stacks, such as sacks or the like. 3,727,369, Cl. 53-159.000.

Lassig, Harry. Apparatus for loading containers. 3,727,370, Cl. 53-159.000.

Laval, Claude, to Lebocey Industrie, Societe Anonyme. Weft thread selecting and handling means for gripper shuttle loom. 3,727,647, Cl. 139-122.00w.

Layman, Lee R., to Monsanto Company. Forming articles from sheet material. 3,728,062, Cl. 425-291.000.

Le Master, Harold A. Adjustable fishing lure. 3,727,339, Cl. 43-42.220.

Le Voy's Inc.: *See—*
Sorenson, James L.; Pannier, Karl A., Jr.; and Reynolds, Gordon S., 3,727,613.

Leach, Raymond B., to Miracle Hub and Wheel, Inc. Wheel with resilient hub. 3,727,983, Cl. 301-136.000.

Lebocey Industrie, Societe Anonyme: *See—*
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Lee, Alex Y.; and Gershberg, David N., to Mosler Safe Company, The. Differential doppler detection for RF intruder alarm systems. 3,728,721, Cl. 343-5.0pd.

Lee, Art: *See—*
Finnegan, Cyril Owen; and Lee, Art, 3,728,606.

Lee, James O., to Olsen, Olaf M. and McCarthy, John L. Lobster preservation system. 3,727,579, Cl. 119-2.000.

Lee, Lester T. C.; Pearce, Eli M.; and Litt, Morton H., to Allied Chemical Corporation. Dicarboxylic acids containing diketopiperazine groups and polymers prepared therefrom. 3,728,348, Cl. 260-268.0dk.

Lee, Raymond, Organization, Inc., The: *See—*
Blinkhorn, Harold L., 3,728,471.

Leesona Corporation: *See—*
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Richter, Hans H., 3,727,855.

Lefebvre, Jean Henri: *See—*
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LeFeuvre, Thomas, to Thermo Electron Corporation. Throttle valve. 3,727,406, Cl. 60-108.000.

Lefort, Marcel: *See—*
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Lehmann, Joachim: *See—*
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Lemmen, Hendrikus Johannes; Van Ruler, Johannes; and Scholten, Pieter Cornelis, to U.S. Philips Corporation. Method of manufacturing a magnetic tape lacquer. 3,728,262, Cl. 252-62.540.

Lenert, August, to Siemens Aktiengesellschaft. X-ray tube. 3,728,568, Cl. 313-60.000.

Lenzkes, Herbert H., to General Dynamics Corporation. Electronic system for the stimulation of biological systems. 3,727,616, Cl. 128-422.000.

Leonard, Verna M. Holder and guide for writing and reading music. 3,728,462, Cl. 84-471.000.

Leonov, Gennady Mikhailovich: *See—*
Krikorov, Vadim Sergeevich; Krasov, Vladimir Grigorievich; Sukhodaev, Boris Alexandrovich; Kokin, Vitaly Kazimirovich; Zheleninsky, Valentin Danilovich; Sukhanov, Nikolai Mefodievich; Leonov, Gennady Mikhailovich; Likholetov, Nikolai Ivanovich; Kovalev, Igo Tikhonovich; Gusev, Vladimir Vladimirovich; and Medvedev, Andrei Petrovich, 3,728,436.

Lerner, David S., to Lockheed Electronics Company, Inc. Power distribution network. 3,728,648, Cl. 333-6.000.

Les Forges de Zeebrugge S.A.: *See—*
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Leuteritz, Raoul H.; and Dima, Attila, to General Cable Corporation. Mechanical pressure type electrical connections for terminating and connecting metallic cable shields. 3,728,472, Cl. 174-78.000.

Levin, Myron M., to E-Z POR Corporation. Attachment to rim of a paint can or the like. 3,727,792, Cl. 220-90.000.

Levin, Solomon Isaakovich: *See—*
Alexandrov, Albert Ivanovich; Levin, Solomon Isaakovich; Chestnov, Valery Fedorovich; Kovaleva, Raisa Markovna; Birjukova, Tatyana Semenovna; Burko, Albert Ivanovich; and Naumov, Mikhail Grigorievich, 3,728,005.

Levine, Aaron J. Plumbing tool. 3,727,261, Cl. 15-104.3sn.

Levine, Marvin S., to General American Transportation Corporation. Method of blending reinforcing fibers and molding resins and product thereof. 3,728,294, Cl. 260-29.10b.

Levolor Lorentzen, Inc.: *See—*
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Levy, Joseph; and Walker, William, to Universal Oil Products Company. Catalytic reduction process. 3,728,376, Cl. 260-472.000.

Levy, Joseph; and Seif, Louis, to Universal Oil Products Company. Preparation of p-nitrosodiphenylamine. 3,728,392, Cl. 260-576.000.

Lewis, Charles B.: *See—*
Cranston, Albert E., III; and Lewis, Charles B., 3,727,965.

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Lieberman, George; Pierce, Victor J.; and Prussin, Samuel B. Pressurized foam-producing composition and process therefor. 3,728,276, Cl. 252-305.000.

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Lienhard, Paul; Beffa, Fabio; and Soiron, Charles, to Geigy, J. R., A.G. Cobalt complexes of an azo compound and a tridentate organic ligand. 3,728,328, Cl. 260-147.000.

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Links, Heinz, to Bosch, Robert, GmbH. Control device for hydraulically operated tappet valves of internal combustion engines. 3,727,595, Cl. 123-90.120.

Linstromberg, William J., to Whirlpool Corporation. Twist tray ice maker with removable tray. 3,727,428, Cl. 62-300.000.

Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, to Moskovsky tetilny Institut. Method of removing metal values from solution. 3,728,103, Cl. 75-101.0be.

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Livingston, William L., to Factory Mutual Research Corporation. Self-extinguishing flammable mixtures. 3,728,258, Cl. 252-8.100.

Lloyd, Kenneth F.; and Strak, Michael G. Disposable apron. 3,727,236, Cl. 2-51.000.

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Lorenzini, Raymond; Vieira, Thomas L.; and Wallace, Robert G., to Eastman Kodak Company. Tray loading and indexing mechanism. 3,727,371, Cl. 53-246.000.

Loricchio, Domingos, to Carborundum Company, The. Additives for production of cast irons. 3,728,107, Cl. 75-130.00r.

Louderback, Allan L., to Baxter Laboratories, Inc. Blood serum analytical control standard. 3,728,226, Cl. 195-103.50r.

Louton, James C., Jr.: *See—*
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Love, John J.: *See—*
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Low, William H., Jr.; and Schaller, David R., to Horizons Incorporated; a division of Horizons Research Incorporated. Apparatus for thermally fixing a non-silver free radical photosensitive composition. 3,727,534, Cl. 95-89.00r.

Luckers, John, to Centre National de Recherches Metallurgiques. Gas composition analysis. 3,727,450, Cl. 73-23.000.

Lucky Stores, Inc.: *See—*
Ross, Joseph H., 3,727,308.

Luders, Davis John. Grain storage. 3,727,656, Cl. 150-1.000.

Luksas, Anthony J., to Beatrice Foods Co. Preparation of a bland whey product. 3,728,128, Cl. 99-57.000.

Lummus Company, The: *See—*
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Lumpp, Gunther: *See—*
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Lundin, Sven Vilhelm Emanuel, to Humanteknik AB. X-ray apparatus and an operation lighting. 3,728,547, Cl. 250-90.000.

Lushkov, Evgeny Natanovich: *See—*
Gaisenok, Arseny Alexandrovich; Belyavin, Yury Pavolovich; Glozman, Moisei Kalmanovich; Rakovsky, Boris Albertovich; Rakovsky, Emmanuil Albertovich; Chikov, Gennady Mikhailovich; Maslovsky, Valery Georgievich; Lushkov, Evgeny Natanovich; and Velsman, Rix Rcovich, 3,727,416.

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Lyall Electric, Inc.: *See—*
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Lynch, Frederick W.: *See—*
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Lyons, Sanford C., to Georgia Kaolin Company. Method and apparatus for classifying fine particle materials. 3,727,831, Cl. 233-7.000.

Lystad, Leonard A., to General Motors Corporation. Vehicle seat. 3,727,976, Cl. 297-340.000.

Lytle, Clara A.: *See—*
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Lytle, George F.; deceased (by Lytle, Clara A.; executrix), to Eaton Corporation, mesne. Power hoist with load brake. 3,727,887, Cl. 254-168.000.

Maagdenberg, Ronald R., mesne: *See—*
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Mac Donald, Ira A.: *See—*
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Mac Lean, George D. Variable contour golf putting device. 3,727,917, Cl. 273-176.00h.

Machacek, Jiri: *See—*
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Machala, John M. Concrete pit and deck construction for platform scales and method of making the same. 3,727,707, Cl. 177-134.000.

Macker, John Arthur; and Keenan, William Francis, to Burroughs Corporation. Programmatically controlled interrupt system for controlling input/output operations in a digital computer. 3,728,693, Cl. 340-172.500.

MacLeod, Norman M. Bag forming filling, and sealing apparatus. 3,727,373, Cl. 53-183.000.

Maclin, Ernest; and Perle, Abe J., to Electro-Nucleonics Inc. Temperature control for centrifugal analyzer. 3,727,832, Cl. 233-11.000.

Madigan, Thomas S.; Stone, Richard F.; Dunn, David C.; Holzer, William F.; and Sweet, Robert H., to Cubic Corporation. Optical distance measuring equipment. 3,728,025, Cl. 356-5.000.

Madono, Osamu, to Riken Piston Ring Kogyo Kabushiki Kaisha. Method of joining consumable electrode in electroslag melting. 3,727,300, Cl. 29-483.000.

Madsen, Ditlev P.; and Rybicki, Norman, to Chemetron Corporation. Press with semi-automatic cycle. 3,727,545, Cl. 100-53.000.

Maekawa, Mitugi. Motor-driven actuator. 3,727,472, Cl. 74-89.150.

Magic Dot, Inc.: *See—*
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Maier, Gerhard; and Henes, Siegfried, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Incandescent lamp with regenerative cycle. 3,728,572, Cl. 313-222.000.

Maier, William. Electrical outlet box with cable connectors. 3,728,470, Cl. 174-58.000.

Maki, Earl G., Jr. Snowmobile towing hitch. 3,727,937, Cl. 280-24.000.

Malen, Charles; Danree, Bernard; and Desnoyers, Pierre, to Societe en nom Collectiv "Science Union et Cie," Societe Francaise de Recherche Medicale-Suresnes. α(M-Alkoxyphenoxy) and α(M-trifluoromethylphenoxy) M-toluic acids. 3,728,383, Cl. 260-520.000.

Mallory, P. R., & Co., Inc.: *See—*
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Maloney-Crawford Tank Corporation: *See—*
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Manabe, Mitsuo, to Fujitsu Limited. System of driving a pulse motor. 3,728,602, Cl. 318-434.000.

Mangialardi, John K., to United States of America, Atomic Energy Commission. Solids accumulator pump system. 3,728,047, Cl. 417-488.000.

Mankowich, Ivan: *See—*
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Mansfield Sanitary, Inc.: *See—*
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Maremont Corporation: *See—*
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Mares, Milos; Nosek, Stanislav; Martinek, Lumir; and Rohlena, Vaclan, to Vyskumny Ustav Bavlnarsky. Apparatus for compensating the deviations of warp tension in weaving looms. 3,727,646, Cl. 139-97.000.

Margoshes, Marvin: *See—*
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Markelova, Nina Ivanovna: *See—*
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Markos, Charles S., to Searle, G. D., & Co. 6-Alkyl-3-hydrocarbonaceous-16 alpha, 17 alpha-dihydroxypregna-3,5-dien-20-one cyclic 16,17-acetals and congeners. 3,728,338, Cl. 260-239.55d.

Markovitz, Mark; and Kohn, Leo S., to General Electric Company. Composition comprising an epoxy resin with an organostannois and carboxylic acid anhydride reaction product. 3,728,306, Cl. 260-47.0ec.

Marks, Colin Elliott; and Miller, John, to Fisons Limited. Corrosion inhibiting composition containing hydrazine and a pyrazolidone or an aminophenol. 3,728,281, Cl. 252-392.000.

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Marlow, Jerry R.: *See—*
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Marot, Maurice R., to Electrical Protection Company (Proprietary) Limited. Core-balance earth leakage protection. 3,728,580, Cl. 317-18.00d.

Marra, Dorothea: *See—*
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Marsh, William Cornelius, to Societe d'Assistance Technique pour Produits Nestle S.A. Agglomerating powdered products. 3,727,839, Cl. 239-8.000.

Marshall, Preston F.; and Kendall Company, The, to Vacuum drafting of fibrous strands. . 3,727,270, Cl. 19-156.300.

Marten, Henry Richard: *See—*
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Martin, Andrew R. Method of applying alternate layers of plastic foam and glass fibers to a metal tube. 3,728,187, Cl. 156-162.000.

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Martin, Harold B., to Graber-Rogg, Inc. Tamper-proof container. 3,727,749, Cl. 206-17.500.

Martin, Ronald C.; and Sixt, Marty E., to Advanced Drainage Systems, Inc. Tube coupling. 3,727,953, Cl. 285-177.000.

Martin, Stephen A., to United Aircraft Corporation. Universal joint employing a fluid bearing. 3,727,408, Cl. 60-232.000.

Martin, Thomas W., Jr.: *See—*
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Martin, Thomas W., Sr.; and Martin, Thomas W., Jr., to Cutters Machine Company, Inc. Cloth feeding and spreading mechanism for cloth spreading machine. 3,727,907, Cl. 270-31.000.

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Marunaka Tekkosho Inc.: *See—*
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Marx, John W.; and Bowman, Mark M., Jr., to Phillips Petroleum Company. Process for the in situ sealing of soil surrounding underground conduit breaks. 3,727,412, Cl. 61-36.00r.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Glass fiber reinforced elastomers. 3,728,146, Cl. 117-72.000.

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Massey-Ferguson Industries Limited: *See—*
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Mathieu, Francois Joseph Henri Hubert; and Mathieu, Odile Jeanne Marie. Apparatus for liquid-liquid extraction. 3,728,082, Cl. 23-269.000.

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Mattern, Jean; Licentia Peter; and Zeitzschel, Gunter, to Licentia, Patent-Verwaltungs-G.m.b.H. Control rod drive in the interior of a pressure vessel. 3,728,219, Cl. 176-36.00r.

Matthews, Solomon Bertram, to Canadian Marconi Company. Circuit for avoiding false lock. 3,728,533, Cl. 235-181.000.

Matthey, Maurice L., to Manutar S.A. Tap-carrier. 3,727,469, Cl. 74-89.000.

Mauvernay, Roland Yves; and Busch, Norbert, to Societe Anonyme dite: Centre Europeen de Recherches Mauvernay-Cerm. Medicament with an anti-inflammatory and anti-ulcerous action. 3,728,457, Cl. 424-274.000.

Maux, Raymond, to Societe Chimique des Charbonnages. Preparation of formaldehyde. 3,728,398, Cl. 260-603.0hf.

Maxime, Jacques; and Larribaut, Rene, to French State, represented by the Minister of Armed Forces, Ministerial Delegation for Weapons Technical Direction of Land Weapons Manufacturing Workshop of Tarbes. Means for controlling the firing of a gun against amovable target. 3,727,514, Cl. 89-41.00e.

Maxion, Emil J., to Mobil Oil Corporation. Progressive heating in polyester condensations. 3,728,309, Cl. 260-75.00m.

May, Howard V.: *See—*
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May, Joe Cyril, to Superior Electric Company, The. Bi-directional energizing circuit for a stepping motor with means to prevent conduction in one coil until previously energized coil conduction is extinguished. 3,728,598, Cl. 318-696.000.

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McCabe, Francis J. Device for mounting fire damper. 3,727,663, Cl. 160-84.00r.

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McCord Corporation, mesne: *See—*
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McCornnell, Lorne D., to I-T-E Imperial Corporation. Resistor and means for gradually inserting resistor in parallel with interrupter contacts. 3,728,505, Cl. 200-144.0ap.

McCune, Robert B.; and Koment, Edward J., to Abex Corporation. Cross-over control for classification yard having two hump tracks. 3,727,559, Cl. 104-26.00r.

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McDonnell Douglas Electronics Company: *See—*
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McEwan, William S.; Jonassen, Hans B.; and Morley, Carl H., to United States of America, Navy. Chemiluminescent formulation. 3,728,271, Cl. 252-188.3cl.

McEwen, John C., to General Motors Corporation. Double life shaft seal. 3,727,923, Cl. 277-9.000.

McFarland, Frederick R.: *See—*
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McGarr, John Joseph; and Vorhauer, Bruce Ward, to USM Corporation. Machines for coating sheet material. 3,727,577, Cl. 118-630.000.

McGee, Paul D.; and Artner, Marcus M., to Motorola, Inc. Door assembly for cartridge tape player. 3,728,000, Cl. 312-9.000.

McGhay, Maynard H.: *See—*
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McGrath, Harry; Moore, Raymond Frederick; and Smith, Eric, to Imperial Chemical Industries Limited. Polyamides foamed with N-substituted carbamic ester blowing agents. 3,728,292, Cl. 260-2.50n.

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McAlister, Craig L., 3,728,657.

McInnis, Andrew M. Non-leak valve of plastic construction. 3,727,630, Cl. 137-218.000.

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McIntosh, Billy L., to Weston Instruments Inc. Skew device. 3,728,679, Cl. 340-146.10f.

McKeever, Leland Dennis; and Cheng, Wen-Jiu, to Dow Chemical Company, The. Tertiarybutyl styrene/butadiene block copolymers as adhesives. 3,728,193, Cl. 156-334.000.

McKinney, John J., to MCW Holdings Ltd. Garbage compactor. 3,727,546, Cl. 100-229.00a.

McKown, Gary C.; Simons, Gerald F.; and Lynch, Frederick W., to Sperry Rand Corporation. Digital electrohydraulic servo system. 3,727,520, Cl. 91-433.000.

McLain, Charles D.: *See—*
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Mennuto, Anthony R. Door assembly. 3,727,664, Cl. 160-90.000.

Menyailo, Anatoly Tikhonovich; Pokrovskaya, Inna Evgenievna; Pospelov, Mikhail Valerievich; and Yakovleva, Antonina Karpovna, to Nauchno-Issledovatelsky Institut Sinteticheskikh Spirtov. Method of producing 1,8-naphthaldehyde monocarboxylic. 3,728,384, Cl.260-523.00r.

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Nigro, Louis V., to Gillette Company, The. Dispersant container and dispenser. 3,727,840, Cl. 239-43.000.
Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Press for hydrostatic extrusion of tubing. 3,727,444, Cl. 72-60.000.
Nimes, Karl, to Siemens Aktiengesellschaft. Ground protection apparatus for electrical equipment with Y-connected windings. 3,728,618, Cl. 324-51.000.
Ninomiya, Satoshi: *See—*
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Nippon Concrete Kogyo Kabushiki Kaisha: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Nippondenso Co., Ltd.: *See—*
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Orito, Zen Ichi; Sugimoto, Hiroshi; Uchida, Minoru; Sahara, Hajime; Takesue, Masatoshi; and Nishida, Kiyoharu, 3,728,072.
Nishida, Masamitsu; and Ouchi, Hirumu, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramic compositions. 3,728,263, Cl. 252-62.900.
Nishikawa, Tatsuo, to Canon Kabushiki Kaisha. Key apparatus and arrangement thereof. 3,728,652, Cl. 335-207.000.
Nishiyama, Keizo; Takaoka, Hikaru; and Nakayama, Shozo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Gas compressor. 3,727,524, Cl. 92-169.000.
Nishizawa, Mitsunori; and Kato, Mahiko, to Tokico Ltd. Flow quantity controlling apparatus. 3,727,634, Cl. 137-486.000.
Nitto Giken Kabushiki Kaisha: *See—*
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Nitz, Rolf-Eberhard: *See—*
Raabe, Thomas; Piesch, Steffen; Resag, Klaus; and Nitz, Rolf-Eberhard, 3,728,340.
Nixon, Phillip. Drink dispensing and mixing system. 3,727,799, Cl. 222-129.400.
Nizovsky, Boris: *See—*
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NL Industries, Inc.: *See—*
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Noble, Myron C.: *See—*
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Noll, Hans. Flow cell for spectroscopic analysis of density gradients. 3,728,032, Cl. 356-246.000.
Noothout, Arend Jaman, to Reactor Centrum Nederland. Preparation of metal oxide grains. 3,728,421, Cl. 264-.500.
Norcon (Norris) Limited: *See—*
Ward, Edward John, 3,727,881.
Nordal, Donald A.: *See—*

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Nordvik, Donald T. Combination snow shovel and snow puller. 3,727,964, Cl. 294-54.000.

Norfleet, James: *See—*
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Norick, William B.: *See—*
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Easoz, Robert D.; and Robinson, Nelson M., 3,727,550.
Elson, Edward E.; Isenberg, Don L.; Schnauss, Edwin R.; Sie, Edward H. C.; Wagoner, Earl V., Jr.; and Weisbart, Melvin S., 3,728,227.
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Notte, Angelo Joseph; Hold, Peter; and Spitzner, Klaus Juergen, to USM Corporation. Feedback control for a continuous mixer having control of internal pressure. 3,727,892, Cl. 259-10.000.

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Nowicki, Jan, to Bell-Canada-Northern Electric Research Limited. Post pay telephone paystation circuit. 3,728,490, Cl. 179-6.300.

Noyli, Shimon. Boat for use as a lifeboat and for other purposes. 3,727,251, Cl. 9-3.000.

Nozawa, Shunichi; Kuroi, Hisashi; Hatada, Masamichi; and Fukuyama, Shunsaku, to Blackwell Electronics Ind. Co., Ltd. High output operating apparatus for a fluorescent lamp. 3,728,578, Cl. 315-99.000.

NRM Corporation: *See—*
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O'Callaghan, Gerald F., to Eaton Corporation. Device for sensing the direction and speed of a shaft. 3,728,565, Cl. 310-168.000.

Offerman, Seymour, to Industrial Electronic Hardware Corp. Kinescope tube socket with component receiving means. 3,728,587, Cl. 317-118.000.

Ogden, Hubert S. Filtering apparatus having an integrally removable filter cartridge. 3,727,764, Cl. 210-232.000.

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Okubo, Masuta; and Kawawa, Takaho, to Nippon Kokan Kabushiki Kaisha. Manufacturing method of free-cutting lead steel. 3,728,109, Cl. 75-51.000.

Okuda, Masanao: *See—*
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Okuno, Chuzo: *See—*
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Olashaw, William F., to General Electric Company. Electric switchboard assembly with busbar heat pipe means. 3,728,585, Cl. 317-100.000.

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Orlov, Alexandr Mikhailovich: *See—*
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Osborne, Eugene F.; Rueger, Lauren J.; and Gooding, Otis E., to United States of America, Navy. Time-multiplexed time reference dissemination system. 3,728,485, Cl. 178-69.50r.

Osborne, John Francis; and Pille, Hans Joachim, to Motorola, Inc. Method of causing adherence of glass to gold. 3,728,176, Cl. 156-3.000.

Osepchuk, John M., to Raytheon Company. Image correlator tube with secondary transmission of collimated rays. 3,728,577, Cl. 315-11.000.

Osipow, Lloyd; and Marra, Dorothea, to Patterson, C. J., Company. Fatty acid lactylates and glycolates for conditioning hair. 3,728,447, Cl. 424-70.000.

Osterholt, Anthony H. Meat slicing knife. 3,727,504, Cl. 83-483.000.

Ostroff, Benjamin; and Ostroff, Melvin George, to Standard Chair of Gardner, Inc. Knocked-down chair. 3,727,981, Cl. 297-440.000.

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Ottman, Gerhard F.; Schnabel, Wilhelm J.; and Smith, Eric, to Olin Corporation. Catalytic process for converting aromatic nitro compounds to aromatic isocyanates. 3,728,370, Cl. 260-453.0pc.

Ouchi, Hirumu: *See—*
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Oughton, John F.: *See—*
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Packard, Norman M., to International Harvester Company. Ring manufacture, productive of line contact seal. 3,727,927, Cl. 277-216.000.
Padovan, Giuseppe. Filter press for continuous filtration under pressure. 3,727,762, Cl. 210-136.000.
Page, Derrick J., to Westinghouse Electric Corporation. Thin film transistor phonograph amplifier. 3,728,496, Cl. 179-100.40a.
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Palazzi, Carlos Alberto. Honing head. 3,727,352, Cl. 51-338.000.
Palmer, Gaylord M., to Foremost-McKesson, Inc. Sodium caseinate-containing product and method for manufacturing. 3,728,127, Cl. 99-20.000.
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Panina, Marina Alexeevna; Kleiner, Gersh Izrailevich; Strukov, Ivan Timofeevich; Zdobnova, Alexandra Fedorovna; Andreeva, Maria Kuzminicha; and Ryabova, Nonna Mikhailovna. Method of obtaining monohydrate of sodium salt of 6-(3-phenyl-5-methlisoxazole-4-caramino)-penicillanic acid. 3,728,333, Cl. 260-239.100.
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Parilla, Arthur R. Duct-forming assemblies and vector control. 3,727,843, Cl. 239-265.350.
Park, Chung Ho, to Du Pont de Nemours, E. I., and Company. Polyureas, polyurethanes and polyamides based on a tetra-oxo diamine component. 3,728,311, Cl. 260-77.50c.
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Parkinson, Michael John, to British Coal Utilisation Research Association Limited, The. Measurement of rates of flow of gases. 3,727,458, Cl. 73-194.00a.
Parrock, Joseph J., to Mosler Safe Company, The. Modular key lock having lever tumblers with bendable portions. 3,727,439, Cl. 70-355.000.
Pars, Harry G.; Razdan, Raj K.; and Weinhardt, Klaus K., to Little, Arthur D., Inc. Ester derivatives of tetrahydrocannabinol. 3,728,360, Cl. 260-345.300.
Passino, Roberto; and Boari, Gianfranco. Apparatus for use in an improved electro-dialysis process. 3,728,248, Cl. 204-301.000.
Pasternak, Stephen F., to Peerless of America, Incorporated. Heat exchangers and the method of making the same. 3,727,682, Cl. 165-183.000.
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Pelly, Brian R.; and Tarjan, Mario G., to Westinghouse Electric Corporation. Control scheme for timing the application of limited duration firing signals to power switching devices. 3,728,557, Cl. 307-252.00n.
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Perl, Theodore. Lightproofed dental radiographic film developer. 3,727,533, Cl. 95-89.00r.
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Peters, Ralph, to Hobson, H. M., Limited. Self-locking coupling. 3,727,958, Cl. 287-95.000.
Petersen, Hans-Gunther; and Requardt, Heiko, to Volkswagenwerk AKT. Apparatus for selecting different generator output ranges in accordance with the speed of a motor driving the generator. 3,728,627, Cl. 324-158.00r.
Peterson, Roy L. Ski boot. 3,727,329, Cl. 36-2.5al.
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Pitchford, Armin C., to Phillips Petroleum Company. Desulfurization of heavy liquid hydrocarbon with carbon monoxide at high pressure. 3,728,252, Cl. 208-243.000.
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Rabinovich, Dov; and Schmidt, Gerhard M. J.; deceased (by Schmidt, Esther; administrator), to Yale Research and Development Co., Ltd. X-ray diffractometer. 3,728,541, Cl. 250-51.500.

Rader, Jerome A. Apparatus for shredding and disposing of construction waste material. 3,727,846, Cl. 241-47.000.

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Rainsberger, Paul J.; and Koff, Irwin, to United States of America, Navy. Electronic interval timer. 3,727,555, Cl. 102-70.20r.

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Reinisch, Frederick Frank. Snap-on one pair block and drames therefor. 3,728,668, Cl. 339-198.00g.

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Reitknecht, Jack. Plastic fountain toothbrush. 3,728,035, Cl. 401-175.000.

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Reuter, Franz Gottfried; and Fensch, Walter, to BASF Wyandotte Corporation. Elastic tear-resistant, high-density foams based on polycarbodiimide polyisocyanates. 3,728,289, Cl. 260-2.5bf.
Rey, Louis. Arrangement for safeguarding a security safe. 3,727,561, Cl. 109-44.000.
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Robbins, James F., to Sybron Corporation. Diaphragm valve. 3,727,623, Cl. 137-1.000.
Roberts, Francis D.; and Norfleet, James, to Colgate-Palmolive Company. Speckled dentrifrice gel. 3,728,446, Cl. 424-49.000.
Roberts, John T.; and Reid, Philip L., to Grace, W. R., & Co. Clipping system. 3,727,288, Cl. 29-211.00d.
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Robinson, James O. Beam antenna selectively oriented to vertical or horizontal position. 3,728,733, Cl. 343-765.000.
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Rocton, Lucien; and Belisaire, Robert, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Coaxial cable having a fluid stop therein and method for producing a coaxial cable which is impervious to the passage of air therethrough. 3,728,466, Cl. 14-23.00r.
Rodriguez, Juan Antonio, to Eastman Kodak Company. Dodging circuitry for photographic printing apparatus. 3,728,022, Cl. 355-80.000.
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Rogowski, Stanislaw, to Pye Limited. Line scanning circuit arrangements having linearizing means. 3,728,579, Cl. 315-27.0td.
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Rohrer, George Andrew, to Technovation, Inc. Thin film ferroelectric device. 3,728,694, Cl. 340-173.200.
Rohs, Hans Guenther. Installation for machining crankshaft, camshafts or like workpieces. 3,727,494, Cl. 82-2.500.
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Rosen, Charles; and Arcaro, Martin J., to Microcom Corporation. High modulation index oscillator-modulator circuit. 3,728,645, Cl. 332-26.000.
Rosenblum, William M., to Polaroid Corporation. Apparatus for projecting a scene. 3,728,014, Cl. 353-38.000.
Ross, Frank, to Velsicol Chemical Corporation. Process for preparing 2,5-dichloro-4-bromophenol. 3,728,403, Cl. 260-623.00h.
Ross, Gerald F., to Sperry Rand Corporation. Transmission and reception system for generating and receiving base-band duration pulse signals without distortion for short base-band pulse communication system. 3,728,632, Cl. 325-38.00r.
Ross, Joseph H., to Lucky Stores, Inc. Apparatus for processing cheese. 3,727,308, Cl. 99-115.000.
Ross, Sigmund Lance, to Shuffman, Oscar. Thermal energy generation. 3,727,588, Cl. 122-487.000.
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Roy, John R. Smokestack with vibration damper. 3,727,566, Cl. 110-184.000.
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Rucker, Dietrich; Eue, Ludwig; and Hack, Helmuth, to Farbenfabriken Bayer Aktiengesellschaft. 2-Perchlorocrotonylamino-5-trifluoromethyl-1, 3,4-thiadiazole. 3,728,354, Cl. 260-306.80d.
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Ruefenacht, Werner Russell. Bearing system for balance knife edges and scale pivots. 3,727,995, Cl. 308-2.00r.
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Santos, Richard A. Drink dispenser and measuring device. 3,727,800, Cl. 222-129.000.
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Sargeant, Ralph G. Method for preparing and dispensing aerated drinks. 3,728,129, Cl. 99-78.000.
Sargent, Frank T., to Thetford Corporation. Closure for bottle. 3,727,784, Cl. 215-40.000.
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Sato, Masanobu, to Olympus Optical Co., Ltd. Photographic camera having automatic exposure control. 3,727,528, Cl. 95-10.00c.
Sauer, Theo; and Schulz, Gunter, Dr., to Agfa-Gevaert Aktiengesellschaft. Process and a device for the continuous preparation of emulsions. 3,728,280, Cl. 252-314.000.
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Schaumburg, Georges. Method for processing hot-rolled metal bodies and the like. 3,727,290, Cl. 29-407.000.
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Schlough, Thomas L., to Park Tool Company. Hydraulic stone splitter with shock absorber means. 3,727,600, Cl. 125-23.000.
Schlueter, David F.; and Noble, Myron C., to FMC Corporation. Casing machine. 3,727,366, Cl. 53-61.000.
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Schott, Charles M., Jr., to Gloucester Engineering Co., Inc. Heat transfer device useful for extruders. 3,727,678, Cl. 165-64.000.
Schrader, Paul G., to Dow Chemical Company, The. Process for potting hollow fiber membranes. 3,728,425, Cl. 264-49.000.
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Schuierer, Manfred, to Bruckner Apparatebau GmbH. Apparatus for drying lengths of dyed fabrics. 3,727,320, Cl. 34-70.000.
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Schultz, William N. Low emission two cycle axially reciprocating engine. 3,727,594, Cl. 123-58.0bb.
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Scott, John Wright Martin. Golf club including image reflector attachment. 3,727,919, Cl. 273-186.00a.
Scott, John Wright Martin. Golf club attachment. 3,727,920, Cl. 273-186.00a.
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Seidl, Franc; and Uebel, Philipp, to Wacker Werke KG. Vibrator for, and method of compacting concrete and similar masses. 3,727,890, Cl. 259-1.00r.
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Seki, Takashi; Saito, Chiharu; Toki, Katsuyuki; Matsuka, Keisuke; Suzuki, Yoshio; and Kobayashi, Akira, to Sumitomo Chemical Co., Ltd. Certain N-substituted octadecadienoic acid amides used to reduce cholesteral levels. 3,728,459, Cl. 424-324.000.
Selig, Hans, to Gebruder Ortlinghius Ohg., Firma. Fluid operated clutch and spring operated brake. 3,727,731, Cl. 192-18.00a.
Selwitz, Charles M., to Gulf Research & Development Company. Process for making polynuclear aromatic compounds. 3,728,409, Cl. 260-668.00c.
Senour, Donald A.; and Kobel, Janusz S., to BLH Electronics Inc. Digital indicator with pulse multiplier for providing continuous full scale resolution. 3,728,625, Cl. 324-99.00d.
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Shapland, James T., to United States Steel Corporation. Mechanism for supporting a submerged pouring tube on a bottom-pour vessel and method of replacing tubes. 3,727,805, Cl. 222-512.000.
Shaughnessy, Ernest P., to Prentice, E. V., Co. Brake mechanism for a reciprocating blade. 3,727,505, Cl. 83-526.000.
Shaw, Clarence W., to McDermott, J. Ray, & Co. Submarine pipeline laying apparatus. 3,727,417, Cl. 61-72.300.
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Shiba, Keisuke; Hinata, Masanao; Yoshida, Makoto; Imai, Shinichi; Sato, Akira; and Shigeru, Kanagawa, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material suitable for silver-dye bleaching method. 3,728,125, Cl. 96-99.000.

Shibata, Fukuo. Arrangement for transmitting mechanical power from a driving machine to a load. 3,728,600, Cl. 318-197.000.

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Shirey, James W., 50% to Schroeder, John. Solderless connectors of the T type. 3,728,666, Cl. 339-177.00r.

Shito, Nobuhiko: *See—*
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Willsey, William W. Vehicle liquid tank transport with flexible partition. 3,727,795, Cl. 220-22.000.

Wilmes, Fran. Fresh air vent. 3,727,539, Cl. 98-41.000.

Wilmot, Kenneth, to Neotechnic Engineering Limited. Valve assemblies for aerosol containers. 3,727,806, Cl. 222-402.200.

Wilson, Frank G. Wringer mop head replacement and actuator mechanism. 3,727,259, Cl. 15-119.00a.

Wilson, Ronald E., to Allis-Chalmers Corporation. Combined transmission. 3,727,479, Cl. 74-333.000.
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Winkle, Gunther, to Krauss-Maffei Aktiengesellschaft. Transport system with moving-platform terminal. 3,727,558, Cl. 104-21.000.
Winkler, Friedrich; and Zanner, Johann, Jr., to Agfa-Gevaert Aktiengesellschaft. Auxiliary drive for components of photographic apparatus. 3,728,013, Cl. 352-166.000.
Winter, Christian, to Huck, Robert and Evers, Gunter Rene. Lipstick case. 3,728,034, Cl. 401-84.000.
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Wisotzky, Reuben; and Slosberg, Davis K., to Pandel-Bradford, Inc. Method of preparing resin-backed tufted carpet tiles. 3,728,182, Cl. 156-72.000.
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Woerner, Rudolph C., to Petro-Tex Chemical Corporation. Reduced fouling in oxidative dehydrogenation process. 3,728,413, Cl. 260-680.00d.
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Wolfe, Maston B., Jr., to Standard Manufacturing Company, Incorporated. Lift truck. 3,727,774, Cl. 214-1.00d.
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Wondergem, Herman William John, to Australian Wire Industries Proprietary Limited. Cooling coated wires, strips and the like. 3,727,895, Cl. 266-3.00r.
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Yano, Nobumitsu; Fukushima, Masao; Kishi, Masanori; and Nagayoshi, Fumio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing pearl essences. 3,728,329, Cl. 260-211.50r.
Yarrington, Robert Warren, to Amchem Products, Inc. Chrome-free deoxidizing and desmutting composition and method. 3,728,188, Cl. 156-22.000.
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Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Solution containing a trivalent antimony-tartaric acid compound. 3,728,367, Cl. 260-446.000.
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Young, J. Beverly, Jr., to Honeywell Information Systems, Inc. Binary arithmetic using analog comparators. 3,728,531, Cl. 235-175.000.
Youngblood, Douglas J., to Texaco Inc. Means and method for controlling independent operating parameters in a process system. 3,728,526, Cl. 235-151.100.
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Zanni, Vincenzo, to Olivetti, Ing. C., & C., S.p.A. Machine for cutting and stripping back electric wires and cables. 3,727,492, Cl. 81-9.50a.
Zaremba, John P., Jr.; Cooney, Peter D.; Hadden, Craig W.; and Shupp, David E., to Progressive Products, Inc. Drain plug assembly. 3,727,638, Cl. 137-572.000.
Zawacki, Walter, to U.S. Turf Corporation. Portable golf game. 3,727,918, Cl. 273-176.0fb.
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Zimmer, Walter George A. Laser guidance system for grade control. 3,727,332, Cl. 37-97.000.

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Zorn, Hugo K.; Muller, Fritz; and Broll, Helmut W., to Agfa-Gevaert Aktiengesellschaft. Multi-layer color photographic material. 3,728,121, Cl. 96-74.000.

Zumach, Gerhard; Anders, Bertram; Grewe, Ferdinand; Kuhle, Engelbert; and Kaspers, Helmut, to Farbenfabriken Bayer Aktiengesellschaft. Fungicidal compositions and methods of combating fungi using phthalimidomethyl isothiocyanate. 3,728,456, Cl. 424-274.000

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D'Alo, Bruno: *See*—
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Du Pont de Nemours, E. I., and Co.: *See*—
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Froelich, Reinhard, and H. W. Yant, to Westinghouse Electric Corp. Combined solid and liquid system for controlling nuclear reactors. T909,020, 4–17–73, Cl. 176—86.
Graham, James L. Interimage effects in photographic color elements. T909,022, 4–17–73, Cl. 96—22.
Jordan, John E., and G. M. Newcombe. Sulfur dioxide removal from stack gases. T909,017, 4–17–73, Cl. 423—242.
Kaukeinen, Joseph Y. Masking of defects in electrophotographic elements. T909,014, 4–17–73, Cl. 117—2.
Kiefer, John E., and R. C. Mumpower. Cigarette filter. T909,021, 4–17–73, Cl. 131—267.
Mann, Horace C., Jr. Production of liquid ammonium polyphosphate. T909,016, 4–17–73, Cl. 71—34.
Mumpower, Robert C.: *See*—
Kiefer, John E., and Mumpower. T909,021.
Murray, Thomas J. Interimage effects in photographic color elements. T909,023, 4–17–73, Cl. 96—22.
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Ninno, Giulio D.: *See*—
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Patterson, John F., Jr., to Westinghouse Electric Corp. Nuclear core inlet flow arrangement. T909,019, 4–17–73, Cl. 176—61.
Pecka, John T., to Du Pont de Nemours, E. I., and Co. Plastic container. T909,015, 4–17–73, Cl. 161—89.
Rissberger, Arthur C., Jr. Slide stick. T909,013, 4–17–73, Cl. 40—158.
Siclari, Francesco, B. D'Alo, and G. D. Ninno, to Snia Viscosa Societa Nazionale Industria. Method and equipment for heat-setting treatment of synthetic filaments by means of infra-red rays. T909,018, 4–17–73, Cl. 264—346.
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Suggs, James L. Polymeric compositions. T909,024, 4–17–73, Cl. 260—861.
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LIST OF REISSUE PATENTEES

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Blattner, Hans: *See*—
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Johnston, Mack S. Re. 27,627.
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Johnston, Mack S., to Draft Systems, Inc. Beer tapping device. Re. 27,627, 4–17–73, Cl. 222—400.7.
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Pollard, Melville R., Jr., to Cintel Corp. Camera tripod head. 226,732, 4–17–73, Cl. D61—1.
Pratt, Robert J. Wall hung holder for record albums. 226,700, 4–17–73, Cl. D6—130.
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Gale, John A., and Haueter. 226,719.
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182.5 3,728,088
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572 3,727,638
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150 3,728,239
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36 3,728,257
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163 3,727,763
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10.55 3,728,512
70 3,728,513
130 3,728,514
131R 3,728,515
3,728,516
316 3,728,517
326 3,728,518

CLASS 220

22 3,727,795
25 3,727,787
44R 3,727,788
3,727,789
54 3,727,790
66 3,727,791
90 3,727,792
93 3,727,793

CLASS 221

3 3,727,794

CLASS 222

26 3,727,796
80 3,727,797
87 3,727,798
129 3,727,800
129.4 3,727,799
196 3,727,801
205 3,727,802
215 3,727,803
318 3,727,804
400.7 Re.27,626
Re.27,627
402.2 3,727,806
469 3,727,807
482 3,727,808
512 3,727,805
541 3,727,809
3,727,810

CLASS 223

70 3,727,811
111 3,727,812

CLASS 224

42.42R 3,727,813

CLASS 225

100 3,727,814

CLASS 226

5 3,727,815
19 3,727,816
3,727,817
44 3,727,818
46 3,727,819
113 3,727,820

CLASS 227

120 3,727,821

CLASS 228

1 3,727,822

CLASS 229

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3,727,824
32 3,727,825
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51C 3,727,828
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54 3,727,830

CLASS 233

7 3,727,831
11 3,727,832

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61.11J 3,728,520
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61.5E 3,728,519
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CLASS 238

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CLASS 241

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35.6R 3,727,852
56A 3,727,853
66 3,727,854
75.5 3,727,856
84.2B 3,727,857
129 3,727,858
182 3,727,859
208 3,727,860

CLASS 244

3.15 3,727,861
54 3,727,862
145 3,727,863
154 3,727,864

CLASS 246

182B 3,728,539

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16 3,727,866
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339 3,727,869
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406 3,727,871
412 3,727,872
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CLASS 250

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52 3,728,542
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CLASS 251

30 3,727,877
57 3,727,878
84 3,727,879
85 3,727,880
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209 3,727,882
306 3,727,883

CLASS 252

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10 3,727,892
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154 3,727,894

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4 3,727,929
50 3,727,930
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95 3,727,958

CLASS 289

15 3,727,959

CLASS 292

216 3,727,960

CLASS 293

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CLASS 296

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3,727,981
452 3,727,980

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23 3,727,994

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252N 3,728,557
262 3,728,558
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291 3,728,561

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184R 3,727,998
216 3,727,999

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CLASS 328

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CLASS 330

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175 3,728,035

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150 3,728,449
180 3,728,450
200 3,728,451
229 3,728,452
251 3,728,453

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	3,728,461	315	3,728,444	78	3,728,054	155	3,728,059	376	3,728,064	95	3,728,067
270	3,728,455	324	3,728,459	84	3,728,055	191	3,728,060	392	3,728,065		3,728,068
274	3,728,456	330	3,728,460	136	3,728,057	198	3,728,061	471	3,728,066	124	3,728,070
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DEFENSIVE PUBLICATIONS APPLICATIONS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

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3,727,355	3,727,555	3,728,006	3,728,583	3,728,334	13 : Re.27,618
3,727,491	3,727,575	3,728,007	3,728,586	3,728,345	3,727,509
3,727,866	3,727,616	3,728,025	3,728,590	3,728,470	3,727,716
4 : 3,727,309	3,727,620	3,728,030	3,728,610	3,728,585	3,727,919
3,727,328	3,727,621	3,728,086	3,728,623	3,728,598	3,727,920
3,727,336	3,727,630	3,728,127	3,728,662	3,728,617	3,728,435
3,727,363	3,727,632	3,728,134	3,728,667	3,728,639	16 : 3,727,627
3,727,384	3,727,635	3,728,152	3,728,671	3,728,703	17 : 3,727,261
3,727,409	3,727,637	3,728,153	3,728,677	3,728,718	3,727,283
3,727,520	3,727,651	3,728,154	3,728,693	3,728,722	3,727,285
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3,727,837	3,727,658	3,728,187	3,728,697	3,727,783	3,727,321
3,728,176	3,727,667	3,728,188	3,728,699	3,727,825	3,727,323
3,728,231	3,727,695	3,728,201	3,728,717	3,728,138	3,727,347
3,728,530	3,727,696	3,728,226	3,728,724	3,728,214	3,727,357
3,728,554	3,727,703	3,728,227	3,728,734	3,728,215	3,727,365
3,728,558	3,727,708	3,728,228	8 : 3,727,303	3,728,216	3,727,366
3,728,560	3,727,718	3,728,250	3,727,845	3,728,316	3,727,386
3,728,561	3,727,728	3,728,251	3,727,859	3,728,320	3,727,389
3,728,593	3,727,748	3,728,253	3,727,885	3,728,321	3,727,395
5 : 3,727,243	3,727,750	3,728,259	3,727,932	3,728,365	3,727,422
3,727,554	3,727,757	3,728,270	3,727,971	3,728,367	3,727,438
3,727,740	3,727,763	3,728,271	3,728,190	3,728,405	3,727,461
6 : Re.27,626	3,727,764	3,728,276	3,728,453	3,728,417	3,727,483
Re.27,627	3,727,766	3,728,311	3,728,454	3,728,443	3,727,485
3,727,237	3,727,768	3,728,335	3,728,461	11 : 3,727,511	3,727,503
3,727,250	3,727,787	3,728,336	9 : 3,727,319	3,728,516	3,727,518
3,727,266	3,727,797	3,728,366	3,727,322	12 : 3,727,247	3,727,521
3,727,268	3,727,798	3,728,372	3,727,353	3,727,251	3,727,541
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3,727,374	3,727,900	3,728,515	3,728,057	3,728,031	3,727,754
3,727,375	3,727,901	3,728,520	3,728,061	3,728,049	3,727,792
3,727,387	3,727,904	3,728,522	3,728,062	3,728,129	3,727,799
3,727,397	3,727,914	3,728,524	3,728,155	3,728,179	3,727,807
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3,727,474	3,727,955	3,728,551	3,728,204	3,728,630	3,727,886
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DESIGN PATENTS

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DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

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U.S. DEPARTMENT OF COMMERCE

Frederick B. Dent, Secretary

PATENT OFFICE

Robert C. Watson, Commissioner